

# THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Kalispell Pole and Timber,  
Reliance Refining Company,  
and Yale Oil Corporation  
Facilities

Addendum to the Final Draft Feasibility  
Study

December 5, 2007



December 5, 2007

Ms. Moriah Bucy  
Montana Department of Environmental Quality  
Remediation Division  
P.O. Box 2000901  
Helena, Montana 59620-0901

**Re: Contract Number 407038, Task Order Number 6 – Sampling and Analysis Results  
Letter Report for the Kalispell Pole and Timber Facility (KRY Site)**

Dear Ms. Bucy:

As required under Task 4, Task Order Number 6, the following information regarding surface water and sediment sampling at the KRY Site is being provided.

**Sampling and Analysis Results Report for the Kalispell Pole and Timber, Reliance Refinery and Yale Oil (KRY) Facilities (KRY Site).**

On October 9 and 10, 2007, Pioneer Technical Services, Inc. (Pioneer) personnel met Ms. Moriah Bucy of the Montana Department of Environmental Quality (DEQ) to sample the Stillwater River near the Kalispell Pole and Timber, Reliance Refinery and Yale Oil Facilities, collectively referred to as the KRY Site (Figure 1). Three locations that had been sampled for dioxin/furan analysis during the 2006 Remedial Investigation (RI) (KRY-200, KRY-202, and KRY-203) were identified by Ms. Bucy and confirmed by locating the rebar marking each point. Flow gauging was conducted at each of those three points along a transect (perpendicular to flow) to determine areas of relative high, medium, and low stream velocity as specified in the *Sampling and Analysis Plan (SAP) Surface Water and Sediment Sampling for the Kalispell Pole and Timber, Reliance Refinery and Yale Oil Facilities, Kalispell, Montana* (DEQ/RD-Pioneer, 2007). Results of the flow gauging are presented in Table 1 and the areas identified for the relative low, medium and high flow sampling are also identified. The low flow sample at each location was collected in the Stillwater River nearest the rebar location marker. The flow was not measured at the low flow sample collection areas at KRY-202 and KRY-203, as these were small back eddies of the Stillwater River. Water could be seen flowing in and out of these two areas, but no flow could be measured within the small ponded areas. Based on the location of the stakes, it was thought that these sample sites were near the original sample locations.

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At each sample site, all water samples were collected first and field parameters including temperature, pH, specific conductance (SC), REDOX potential (eH), and dissolved oxygen (DO) were conducted for each sample. Field parameter and sampling information is included in Table 2. Each sample location was surveyed using a handheld Global Positioning System (GPS) receiver and photographed.

The GPS coordinates are included in Table 2 and sample locations are identified on Figure 2. Photographs of each sample location are provided in Attachment A and a copy of the field logbook is included in Attachment B. The original logbook is located at Pioneer's office in Butte, Montana. Sediment sampling was undertaken once the water sampling was completed. Water and sediment sampling were completed in the following order:

- KRY-203-A, KRY-203-C, KRY-203-B, KRY-303-A, KRY-303-C, KRY-303-B;
- KRY-202-A, KRY-202-C, KRY-202-B, KRY-302-A, KRY-302-C, KRY-302-B; and
- KRY-200-A, KRY-205, KRY-200-B, KRY-200-C, KRY-300-A, KRY-300-B, KRY-300-C.

Those samples identified as "A" samples were collected in the area of the flow gauging transect identified as low flow, the "B" samples were collected in the area of the transect identified as relative medium flow, and the "C" identified samples were collected from the highest flow area of each transect.

Surface water samples were collected by immersing the sample container directly into the water by facing upstream with the sample bottle also facing upstream and slowly lowering and raising the container in the upper half of the water column, allowing the container to fill completely. Once the water sample was collected at each location, a container was collected for field parameters. Once water sampling was complete at the transect location the sediment samples were collected. At each of the low flow sampling sites (KRY-300-A, KRY-302-A, and KRY-303-A) the sediment sample was collected with a decontaminated stainless steel scoop. Sediment was placed in a decontaminated disposable aluminum pan, mixed and then placed into the appropriate sample containers. The sediment samples at KRY-303-B, KRY-303-C and KRY-302-B were also collected using a stainless steel scoop and mixed in a decontaminated disposable aluminum pan. Only enough sediment could be collected at KRY-303-C to fill half of the dioxin/furans sample container. The total organic carbon (TOC) was not collected at this sample location because of the lack of appropriately sized material (coarse sand or finer). Sediment samples collected from KRY-302-C, KRY-300-B, and KRY-300-C were collected with a decontaminated stainless steel sediment corer. Sediment collected with the corer was placed in a decontaminated disposable aluminum pan. Once enough material was collected it was mixed with a decontaminated stainless steel scoop and placed in the appropriate containers.

All equipment was decontaminated prior to use and between each sample by a tap water rinse, a soap and water wash, a tap water rinse, a de-ionized water rinse and finally a hexane rinse. Once the equipment was dry it was wrapped in foil for transport to the sampling location.



No opportunity samples were collected. A large dirt berm was in place between portions of the KRY Site and the Stillwater River, which may limit to some extent, direct surface water runoff releases to the river.

Dioxin/furans samples were submitted to PACE Analytical, Inc. in Minneapolis, Minnesota, for analysis using U.S. Environmental Protection Agency (EPA) Method 8290. The Total Suspended Solids (TSS) surface water samples were submitted to Energy Laboratories in Helena, Montana for analysis using EPA Method 160.1. The sediment samples were analyzed for Total Organic Carbon (TOC) using standard Method 5310B, as recommended by the Washington Department of Ecology. An independent validation of the laboratory data has been conducted by Portage Environmental, Inc. (Portage) of Butte, Montana.

As per the SAP (DEQ/RD-Pioneer, 2007), the sediment samples were shipped to the laboratories but were held until surface water results were received. The surface water samples did not confirm an increase of dioxin/furan concentrations in the Stillwater River as it flows through the KRY Site; therefore, the sediment samples were not analyzed.

Sample KRY-205 was collected as a field duplicate of KRY-200-A. Sample KRY-204 was collected as an equipment rinsate of a stainless steel scoop used for sediment sampling. Type II reagent water was poured down the scoop and directly into the sample container. A bottle blank, KRY-206, was generated by pouring the Type II reagent water directly into the sample containers. The above information was used by the independent data validators when examining the analytical results.

A summary table of the dioxin/furan analyses and the TSS results for the surface water samples are listed in Table 3 with both the laboratory Quality Assurance/Quality Control (QA/QC) qualifiers and data validation qualifiers for each sample. The raw data reports and independent validation reports are attached. The data validation analyst may qualify data with data reporting qualifiers following the guidelines in the EPA's *Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review* (EPA, 1999), *EPA's CLP National Functional Guidelines for Inorganic Data Review* (EPA, 1994), and the EPA's *National Functional Guidelines for Chlorinated Dioxin/Furan Review* (EPA, 2002). Several results were qualified by Portage and are summarized in the following paragraphs. Based on the data validator qualifications, a second 2,3,7,8-TCDD equivalence concentration was calculated and is also presented in Table 3.

The positive detection reported by the laboratory for 1,2,3,4,7,8-HxCDF for KRY-205 was flagged with a "UJ" validation flag indicating that the material was analyzed for, but not detected, and the sample quantitation limit was an estimate due to a positive detection in the method blank and interference in the sample. In addition, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and total HxCDF results for KRY-205 have been qualified with a "U" validation flag to denote the reported concentration is non-detect due to a positive detection in the method blank.

The detected results for 1,2,3,4,6,7,8-HpCDF in KRY-203-A and KRY-205 have been flagged "UJ" by the validators to denote that the reported estimated maximum possible concentration (EMPC) is non-detect and the sample quantitation limit is an estimate due to positive detection in the bottle blank and interference in the sample. The reported EMPC for KRY-206 has been



qualified with a “J” validation flag to denote that the result is an estimate due to interference in the sample.

The result for Total HpCDF reported for KRY-200-B has been qualified with a “J” validation flag to denote the reported concentration is an estimate as it was reported below the quantitation limit.

The total HpCDD results for KRY-200-B, KRY-202-B, KRY-202-C and KRY-203-A have been qualified with a “U” validation flag to denote the reported concentration is non-detect due to positive detection in the bottle blank. The reported result for KRY-206 was qualified with a “J” flag to denote the reported concentration is an estimate as it was reported below the quantitation limit.

The OCDF results reported for KRY-200-A, KRY-200-B, KRY-200-C, KRY-202-A, KRY-202-C, KRY-205 and KRY-206 were all qualified with a “UJ” validation flag because of a positive detection in the method blank and interference in the samples. Sample KRY-202-A was qualified with a “U” flag due to a positive detection in the method blank.

The reported concentrations for OCDD in KRY-200-A, KRY-202-A, KRY-202-C, KRY-203-B, KRY-204, KRY-205, and KRY-206 were assigned a “U” validation flag because of a positive detection in the method blank. The reported EMPC concentrations for OCDD in KRY-200-B, KRY-200-C, KRY-202-B, KRY-203-A and KRY-203-C were qualified with a “UJ” validation flag because of a positive detection in the method blank and interference in the sample.

All TSS sample results were accepted without qualification.

The surface water results were compared to the screening criteria presented in the State of Montana *Numeric Water Quality Standards Circular DEQ-7 (DEQ-7)* (DEQ, 2006). The 2,3,7,8-TCDD equivalence concentration was calculated using the 1998 World Health Organization toxicity factors. These factors are also endorsed by the EPA. Individual PCDD and PCDF compounds are assigned an individual toxicity equivalence factor based on their toxicity relative to 2,3,7,8-TCDD. Calculating the 2,3,7,8-TCDD equivalence concentration of a sample involves multiplying the concentrations of the individual PCDD and PCDF congeners by their respective toxicity equivalence factors, then adding those individual toxicity equivalence products to obtain a total 2,3,7,8-TCDD equivalence concentration for the sample. In addition, DEQ requires that all individual PCDD and PCDF compounds that are reported by the laboratory with non-detect values, have a calculated toxicity equivalence product using one half the reporting limit (RL). The 2,3,7,8-TCDD equivalence concentration for each sample is also presented in Table 3 and on Figure 2. All surface water samples exceeded the DEQ-7 screening criteria of 0.05 picograms per Liter (pg/L) for surface water, including the upstream (background) sample.

The TSS was below the laboratory reporting level of 10 milligrams per Liter (mg/L) for all samples. The water was very clear at sample location sites KRY-202 and KRY-203 and slightly murky at KRY-200. The SC values ranged from 275 microSiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) to 318  $\mu\text{S}/\text{cm}$ . Suspended solids did not appear to affect the surface water results during this sample event.



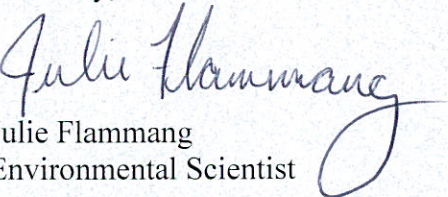
Using the 2,3,7,8-TCDD equivalence concentration for each sample, a statistical analysis was performed to determine if there were any significant differences in the data. The mean of the 2,3,7,8-TCDD equivalence concentration is slightly higher (3.4) for the 3 downstream samples than it was in the 3 samples upstream (2.8) of the KRY Site. An analysis of variance (ANOVA) was completed by comparing the means at each location (upstream, on-site and downstream), and for each of the three flow regimes (relative high, medium and low flows). The ANOVA results indicated that there was no significant difference in the means of the 3 locations or for the 3 flow regimes at the 95% confidence level.

The surface water samples collected during this sampling event did not confirm the increase of dioxin/furan concentrations in the Stillwater River as it flows through the KRY Site that was identified in the 2006 data.

## REFERENCES

- DEQ, 2006. Montana Department of Environmental Quality/Water Quality Bureau. Montana Numeric Water Quality Standards, Circular DEQ-7. February 2006.
- DEQ/RD-Pioneer, 2007. Sampling and Analysis Plan (SAP) Surface Water and Sediment Sampling for the Kalispell Pole and Timber, Reliance Refinery and Yale Oil Facilities, Kalispell, Montana. September 2007.
- EPA, 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008, United States Environmental Protection Agency, Cincinnati, Ohio. October 1999.
- EPA, 1994. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540/R-94/013, United States Environmental Protection Agency. February, 1994.
- EPA, 2002. National Functional Guidelines for Chlorinated Dioxin/Furan Review, EPA 540/R-02/003, United States Environmental Protection Analytical Operation/Data Quality Center. August 2002.

Sincerely,

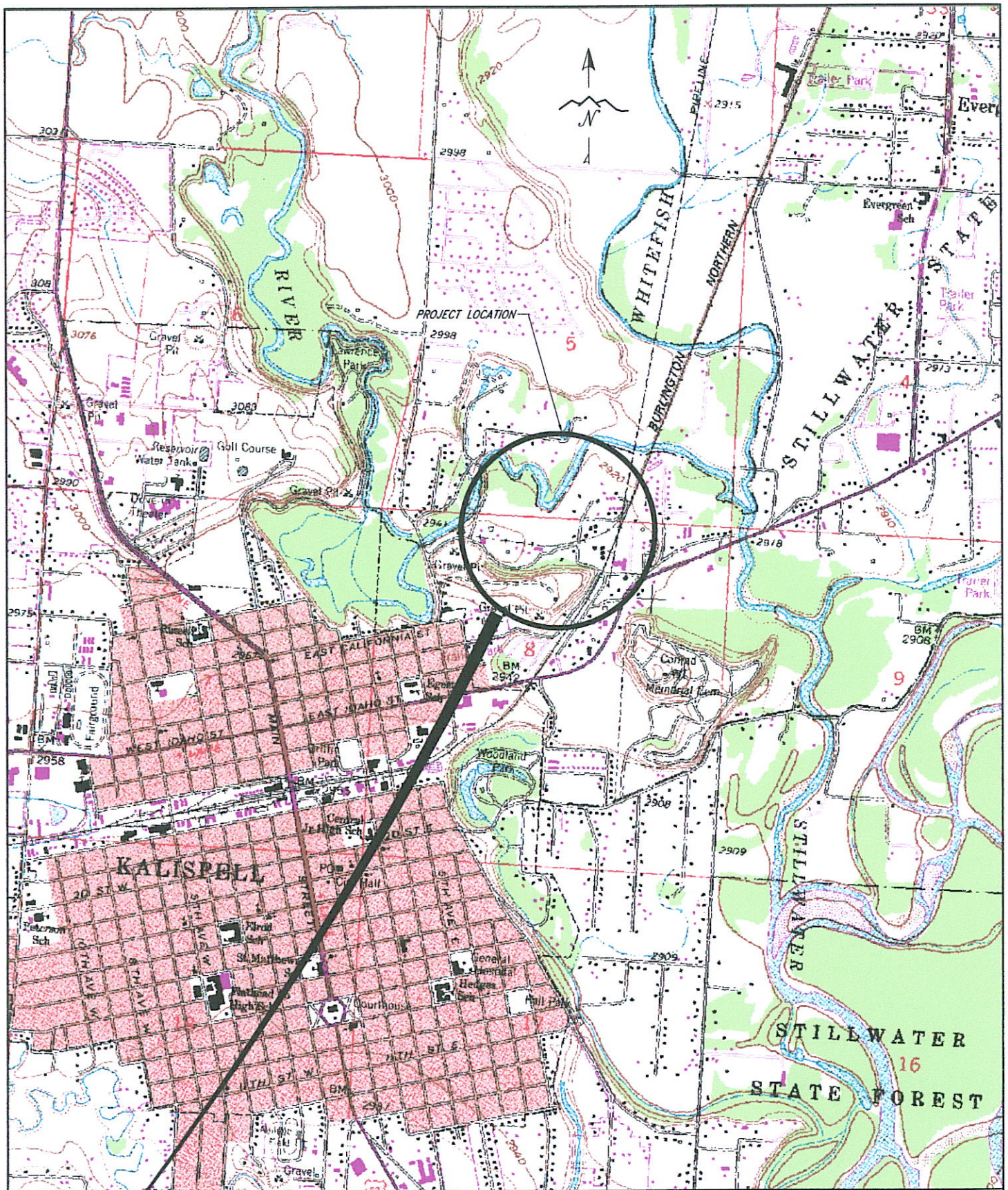
  
Julie Flammang  
Environmental Scientist

cc: Dave Tuesday  
file



## FIGURES



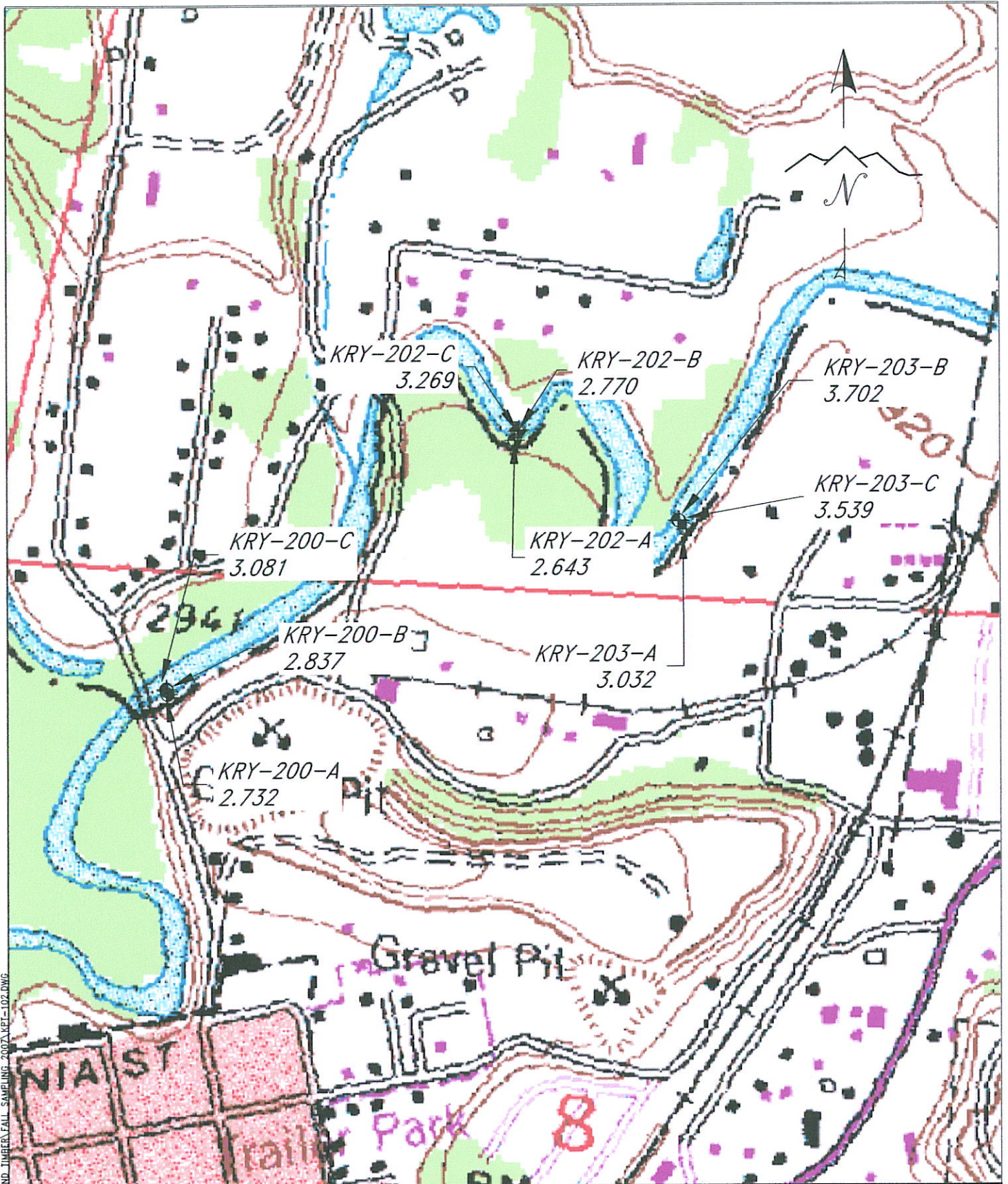


*PIONEER*  
TECHNICAL SERVICES, INC.

FIGURE 1  
KALISPELL, MONTANA  
SITE LOCATION MAP  
KRY SITE

SCALE: 1"=2000'  
DATE: 9/6/07





#### LEGEND

- SAMPLE LOCATION
- SAMPLE ID
- KRY-200-A
- 2.732
- 2,3,7,8-TCDD
- EQUIVALENCE
- CONCENTRATIONS



FIGURE 2  
SAMPLE LOCATION MAP  
LABORATORY VALIDATED  
2,3,7,8 TCDD EQUIVALENCE CONCENTRATIONS  
KRY SITE

SCALE: 1"=500'  
DATE: 12/6/07



## TABLES



Table 1  
Stillwater River Flow Gauging Results  
KRY Site

Distance from IP	Width	Total Depth	Average Velocity	Area	Discharge (Ave V*A)	% of Total Discharge	Relative Flow
KRY-200 Transect							
5.7	0.4	0	0	0	0	0.00	Low
6.5	1.4	0.8	0.19	1.12	0.2128	0.32	Low
8.5	2	0.8	0.22	1.6	0.352	0.52	
10.5	2	0.8	0.26	1.6	0.416	0.62	
12.5	2	1.35	0.33	2.7	0.891	1.32	
14.5	2	1.8	0.34	3.6	1.224	1.82	
16.5	2	2	0.39	4	1.56	2.31	
18.5	2	2.2	0.43	4.4	1.892	2.81	
20.5	2	2.4	0.4	4.8	1.92	2.85	
22.5	2	2.65	0.405	5.3	2.1465	3.18	Medium
24.5	2	2.9	0.445	5.8	2.581	3.83	Medium
26.5	2	3.25	0.515	6.5	3.3475	4.97	
28.5	2	3.6	0.53	7.2	3.816	5.66	High
30.5	2	3.925	0.585	7.85	4.59225	6.81	High
32.5	8	4.25	0.59	34	20.06	29.76	
Water too deep to measure							
46.5	8	4.3	0.475	34.4	16.34	24.24	
48.5	2	3.7	0.365	7.4	2.701	4.01	
50.5	2	3.25	0.31	6.5	2.015	2.99	
52.5	2	2.5	0.2	5	1	1.48	
54.5	2	2.1	0.08	4.2	0.336	0.50	
56.5	2	1.6	0	3.2	0	0.00	
58.5	2	0.95	0	1.9	0	0.00	
60.5	2	0.6	0	1.2	0	0.00	
62.5	2	0.2	0	0.4	0	0.00	
64.5	1	0.05	0	0.05	0	0.00	
Total Discharge (cfs)		67.40305					
KRY-202 Transect							
1.7	0.65	0.05	0	0.0325	0	0.00	
3	1.65	0.5	0	0.825	0	0.00	
5	2	0.4	0	0.8	0	0.00	
7	2	0.8	0.07	1.6	0.112	0.12	
9	2	0.8	0.08	1.6	0.128	0.14	
11	2	0.5	0.09	1	0.09	0.10	
13	2	0.7	0.16	1.4	0.224	0.24	
15	2	0.7	2.28	1.4	3.192	3.48	
17	2	1.35	3.14	2.7	8.478	9.24	
19	2	1.75	3.26	3.5	11.41	12.43	High
21	2	1.9	3	3.8	11.4	12.42	High
23	2	2	2.86	4	11.44	12.47	High
25	2	2	2.79	4	11.16	12.16	
27	2	1.8	2.2	3.6	7.92	8.63	
29	2	1.7	1.92	3.4	6.528	7.11	
31	2	1.5	1.76	3	5.28	5.75	Medium



Table 1  
Stillwater River Flow Gauging Results

KRY Site

Distance from IP	Width	Total Depth	Average Velocity	Area	Discharge (Ave V*A)	% of Total Discharge	Relative Flow
33	2	1.5	1.44	3	4.32	4.71	Medium
35	2	1.6	1.24	3.2	3.968	4.32	Medium
37	2	1.4	0.95	2.8	2.66	2.90	
39	2	1	0.74	2	1.48	1.61	
41	2	0.725	0.57	1.45	0.8265	0.90	
43	2	0.6	0.51	1.2	0.612	0.67	
45	2	0.4	0.5	0.8	0.4	0.44	
47	2	0.2	0.35	0.4	0.14	0.15	
49	1	0.05	0	0.05	0	0.00	
Total Discharge (cfs)					91.7685		
KRY-203 Transect							
6	1	0.5	0	0.5	0	0.00	
8	2	0.3	0.55	0.6	0.33	0.34	
10	2	0.25	0.18	0.5	0.09	0.09	
12	2	0.35	0.32	0.7	0.224	0.23	
14	2	0.2	0	0.4	0	0.00	
16	2	0.5	2.02	1	2.02	2.10	
18	2	0.8	1.31	1.6	2.096	2.17	
20	2	1.25	3.54	2.5	8.85	9.18	
22	2	0.9	3.71	1.8	6.678	6.93	
24	2	1.3	2.34	2.6	6.084	6.31	
26	2	1.3	4.44	2.6	11.544	11.97	High
28	2	1.3	4.77	2.6	12.402	12.86	High
30	2	1	5.11	2	10.22	10.60	High
32	2	0.75	4.24	1.5	6.36	6.60	
34	2	0.75	3.33	1.5	4.995	5.18	Medium
36	2	0.6	3.95	1.2	4.74	4.92	Medium
38	2	0.7	3.87	1.4	5.418	5.62	Medium
40	2	0.6	2.49	1.2	2.988	3.10	
42	2	0.65	2.82	1.3	3.666	3.80	
44	2	0.5	2.97	1	2.97	3.08	
46	2	0.5	1.59	1	1.59	1.65	
48	2	0.35	1.35	0.7	0.945	0.98	
50	2	0.4	1.31	0.8	1.048	1.09	
52	2	0.4	1.44	0.8	1.152	1.19	
54	1	0.2	0	0.2	0	0.00	
Total Discharge (cfs)					96.41		



**TABLE 2**  
**FIELD PARAMETERS**  
**KRY SITE**

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE DATE	SAMPLE TIME	EASTING	NORTHING	Feet from Access Bank	Temperature °C	pH	SC µs/cm	eH mV	DO mg/L
KRY-200--A	Upstream Stillwater River Low Velocity Area	10/10/2007	1600	797594.267	1479721.881	3.3	10.4	8.27	305	-54.28	8.66
KRY-200--B	Upstream Stillwater River Medium Velocity Area	10/10/2007	1610	797591.314	1479736.201	17.8	9.8	8.53	302	-57.6	8.09
KRY-200--C	Upstream Stillwater River High Velocity Area	10/10/2007	1620	797590.109	1479741.487	24.8	9.8	8.53	317	-48.3	8.12
KRY-202-A	Onsite Stillwater River Low Velocity Area	10/10/2007	1325	798964.305	1480628.283	*	11.2	7.87	300	100.8	8.32
KRY-202-B	Onsite Stillwater River Medium Velocity Area	10/10/2007	1345	798981.011	1480666.931	30.2	10.1	8.49	301	4.3	8.57
KRY-202-C	Onsite Stillwater River High Velocity Area	10/10/2007	1335	798975.67	1480662.067	20.2	10.1	8.07	312	74.9	8.28
KRY-203-A	Downstream Stillwater River Low Velocity Area	10/10/2007	950	799693.765	1480215.995	*	9.2	7.25	275	187.1	7.31
KRY-203-B	Downstream Stillwater River Medium Velocity Area	10/10/2007	1000	799663.814	1480250.185	29	8.7	8.10	312	171.3	9.36
KRY-203-C	Downstream Stillwater River High Velocity Area	10/10/2007	1010	799668.455	1480247.437	22	8.8	7.98	318	148.2	8.09
KRY-204	Equipment Rinsate	10/10/2007	1800								
KRY-205	Duplicate of KRY-200-A	10/10/2007	1700			3.3					
KRY-206	Bottle Blank	10/10/2007	1830								

\* - sample collected from low flow area adjacent to rebar location marker, flow not measured as out of main channel  
Easting and Northing coordinates are in Montana State Plane NAD 83



TABLE 3  
Laboratory Analytical Results  
KRY Site

SAMPLE ID	Total 2,3,7,8-TCDD Equivalence <sup>1</sup>	Total 2,3,7,8-TCDD	2,3,7,8-TCDF pg/L	LQ	DVQ	Total TCDF pg/L	LQ	DVQ	2,3,7,8-TCDD pg/L	LQ	DVQ	Total TCDD pg/L	LQ	DVQ	1,2,3,7,8-PeCDF pg/L	LQ	DVQ	2,3,4,7,8-PeCDF pg/L	LQ	DVQ	Total PeCDF pg/L	LQ	DVQ	1,2,3,7,8-PeCDD pg/L	LQ	DVQ	Total PeCDD pg/L	LQ	DVQ	1,2,3,4,7,8-HxCDF pg/L	LQ	DVQ	1,2,3,6,7,8-HxCDF pg/L	LQ	DVQ	2,3,4,6,7,8-HxCDF pg/L	LQ	DVQ	1,2,3,7,8,9-HxCDF pg/L	LQ	DVQ	Total HxCDF pg/L	LQ	DVQ
DEQ-7	0.05	0.05	na			na			na			na			na			na			na			na			na			na			na			na			na			na		
KRY-200-A	2.732	2.726	<1.60			<1.60			<1.30			<1.30			<2.50			<1.90			<2.20			<2.00			<2.00			<0.77			<0.96			<0.88			<1.00			<0.90		
KRY-200-B	2.837	2.822	<0.93			<0.93			<1.40			<1.40			<2.00			<1.80			<1.90			<2.30			<2.30			<1.10			<0.90			<0.83			<1.10			<0.97		
KRY-200-C	3.081	3.074	<0.70			<0.70			<1.50			<1.50			<1.90			<2.30			<2.10			<2.50			<2.50			<0.74			<0.91			<0.80			<1.30			<0.94		
KRY-202-A	2.643	2.642	<0.80			<0.80			<1.20			<1.20			<1.90			<1.80			<2.20			<2.20			<2.40			<1.10			<0.98			<0.67			<1.20			<0.99		
KRY-202-B	2.770	2.760	<0.99			<0.99			<1.20			<1.20			<2.30			<2.00			<2.40			<2.40			<2.40			<1.10			<1.10			<0.99			<0.92			<1.00		
KRY-202-C	3.269	3.256	<0.84			<0.84			<1.40			<1.40			<2.30			<2.00			<2.10			<3.00			<3.00			<1.10			<1.10			<1.00			<1.20			<1.10		
KRY-203-A	3.032	3.015	<1.30			<1.30			<1.40			<1.40			<1.70			<1.80			<2.70			<2.70			<2.70			<0.95			<0.99			<0.93			<1.10			<1.00		
KRY-203-B	3.702	3.701	<1.7			<1.7			<1.5			<1.5			<1.6			<2.9			<2.3			<3.0			<3.0			<1.8			<1.5			<1.5			<1.9			<1.7		
KRY-203-C	3.539	3.539	<0.90			<0.90			<1.70			<1.70			<2.40			<2.40			<2.40			<3.10			<3.10			<0.99			<1.00			<0.99			<1.50			<1.10		
KRY-204	3.626	3.626	<1.2			<1.2			<1.7			<1.7			<2.6			<3.5			<3.0			<2.8			<3.30			<1.5			<1.4			<1.3			<1.7			<1.5		
KRY-205	3.774	3.541	<1.20			<1.20			<1.60			<1.60			<2.30			<2.40			<2.30			<3.30			<3.30			1.3	I	UJ	<1.00			1.4	BJ	U	1.5	BJ	U	2.9	BJ	U
KRY-206	2.674	2.665	<0.88			<0.88			<0.70			<0.70			<1.80			<1.80			<1.80			<2.50			<2.50			<0.81			<0.88			<0.76			<1.20			<0.91		

SAMPLE ID	Total 2,3,7,8-TCDD Equivalence <sup>1</sup>	Total 2,3,7,8-TCDD Equivalence <sup>1</sup>	1,2,3,4,7,8-HxCDD pg/L	LQ	DVQ	1,2,3,6,7,8-HxCDD pg/L	LQ	DVQ	1,2,3,7,8,9-HxCDD pg/L	LQ	DVQ	Total HxCDD pg/L	LQ	DVQ	1,2,3,4,6,7,8-HpCDF pg/L	LQ	DVQ	1,2,3,4,7,8-HPCDF pg/L	LQ	DVQ	Total HpCDF pg/L	LQ	DVQ	1,2,3,4,6,7,8-HpCDD pg/L	LQ	DVQ	Total HpCDD pg/L	LQ	DVQ	OCDF pg/L	LQ	DVQ	OCDD pg/L	LQ	DVQ	TSS mg/l
DEQ-7	0.05	0.05	na			na			na			na			na			na			na			na			na			na			na			
KRY-200-A	2.732	2.726	<1.60			<2.00			<1.60			<1.70			<8.0			<1.50			<1.10			1.1	I, EMPC	UJ	<1.00			2	IY, EMPC	UJ	8.8	BJ	U	<10
KRY-200-B	2.837	2.822	<1.10			<1.30			<1.30			<1.30			<0.83			<1.90			1.8	J	J	2.7	J	U	6	J	U	3	IY, EMPC	UJ	27	I, EMPC	UJ	<10
KRY-200-C	3.081	3.074	<1.40			<1.30			<1.50			<1.40			<0.97			<1.20			<1.10			1.4	I, EMPC	UJ	<1.30			3.3	IY, EMPC	UJ	9.8	I, EMPC	UJ	<10
KRY-202-A	2.643	2.642	<1.50			<1.40			<1.40			<1.40			<0.96			<1.20			<1.10			<1.20			<1.20			2.5	JY	U	8.7	BJ	U	<10
KRY-202-B	2.770	2.760	<1.20			<1.20			<1.10			<1.20			<1.20			<1.40			<1.30			1.9	J	U	1.9	J	U	<1.6			7.6	I, EMPC	UJ	<10
KRY-202-C	3.269	3.256	<1.40			<1.40			<1.40			<1.40			<0.99			<1.70			<1.40			2.3	J	U	7	J	U	3.6	IY, EMPC	UJ	23	BJ	U	<10
KRY-203-A	3.032	3.015	<1.20			<1.30			<1.20			<1.20			1.2	I, EMPC	UJ	<1.50			<1.30			2	J	U	3.6	J	U	<2.70			8.8	I, EMPC	UJ	<10
KRY-203-B	3.702	3.701	<1.8			<1.5			<1.5			<1.6			<1.3			<1.8			<1.5			<1.5			<1.5			<2.9			11.0	BJ	U	<10
KRY-203-C	3.539	3.539	<1.50			<1.00			<1.20			<1.20			<1.40			<1.80			<1.30			<1.30			<1.30			<2.50			5.0	I, EMPC	UJ	<10
KRY-204	3.626	3.626	<2.3			<2.0			<1.7			<2.1			<1.2			<2.20			<2.0			<2.0			<2.0			<4.0			6.0	BJ	U	NR
KRY-205	3.774	3.541	<2.00			<1.80			<2.00			<1.90			2.0	I	UJ	<1.70			<1.50			2.3	I	UJ	<1.30			3.4	IY	UJ	17.0	BJ	U	<10
KRY-206	2.674	2.665	<1.50			<1.60			<1.50			<1.50			0.73	I	J	<0.82			<0.67			1.6	J	U	3.6	J	J	2.00	IY	UJ	11.0	BJ	U	NR

EMPC - Estimated Maximum Possible Concentration  
A - Reporting Limit based on signal to noise  
J - Value below calibration range  
B-Less than 10x higher than method blank level  
I-Interference present  
Y-Calculated using average of daily RFs  
<-less than the listed reporting limit  
**Bolded numbers were detected values**  
<sup>1</sup>Calculated using the 1998 WHO toxicity equivalence factors and the laboratory provided data  
<sup>2</sup>Calculated using the 1998 WHO Toxicity equivalence factors and the results as qualified by the independent data validator (Portage)  
pg/L-picograms per Liter  
mg/L- milligrams per liter  
TSS-Total Suspended Solids



**ATTACHMENT A**  
**PROJECT PHOTOGRAPH LOG**



## KRY Site, Surface Water Sampling, Stream Gauging in the Stillwater River

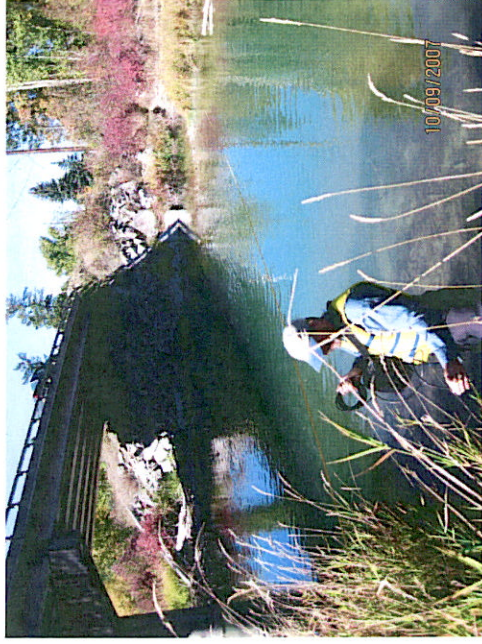


Photo # 1 – KRY-200 Stream gauging location, October 9, 2007, 1428.

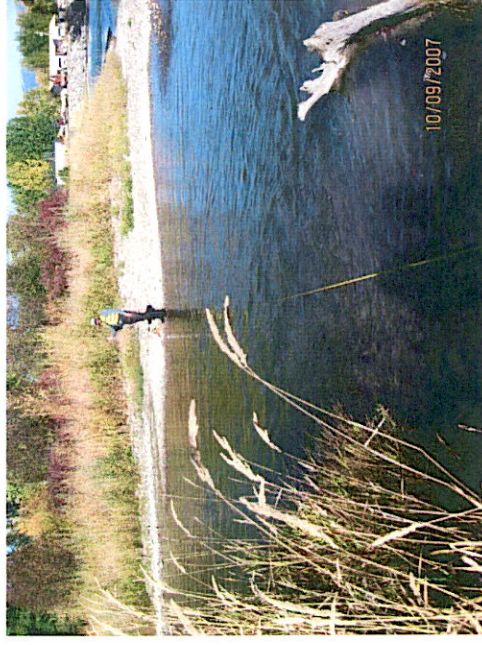


Photo # 2 – KRY-202 Stream gauging location, October 9, 2007, 1554.



Photo #3 – KRY-203 Stream gauging location Low flow area, October 9, 2007, 1700.



Photo # 4 – KRY-203 Stream gauging location – Main Channel, October 9, 2007, 1700.



# KRY Site, KRY-203 Sampling Location



Photo # 5 – Collecting KRY-203-A, the low flow sample, October 10, 2007, 1038.



Photo #6 – KRY-203-C sample location, high flow sample, October 10, 2007, 1043



Photo # 7 – KRY-203-B, sample location, medium flow sample, October 10, 2007, 1045.



# KRY Site, KRY-202 Sampling Location



Photo # 8 – Collecting KRY-202-A, low flow sample, October 10, 2007, 1330.

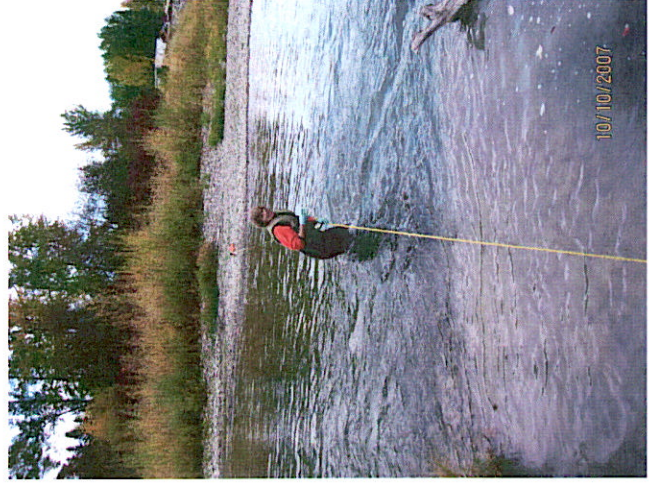


Photo #9 – KRY-202-C sample location, high flow sample, October 10, 2007, 1335



Photo # 10 – Collecting KRY-202-B, medium flow sample, October 10, 2007, 1340.



## KRY Site, KRY-200 Sampling Location



Photo # 11 – Collecting KRY-200-A,  
low flow sample, October 10, 2007,  
1613



Photo #12 – KRY-200-B sample location, medium  
flow sample, October 10, 2007, 1615.



Photo #13 – KRY-200-C sample  
location, high flow sample, October  
10, 2007. 1620.



**ATTACHMENT B**

**COPY OF FIELD LOGBOOK AND  
FIELD GAUGING FORMS**



Sediment / silt Gauging 10/4/07

1345 - Arrive @ Flathead Drive  
Road - Meet Monah Buey-DEO

B. Hollamon } Pioneer  
J. Flannery }

Sunny, Calm, 60's

Safety mfg

- Water for equipment traffic @ Kalliguel Post Road Site
- Electric Fence @ KRY-203
- Water Safety
- Bees / Hornets
- Uneven ground
- Parking / traffic along road @ KRY-200

1350 M. Buey leads way to 1st site -  
Was sent letters to everyone -  
No one @ home locate 1st site  
Discuss strategy for sampling -  
- Decide to sample low flow  
in eddy area adjacent to stake  
- it ~~was~~ may be area originally

Sampled - H. Flow & med flow  
decks will be sampled in  
main channel as determined  
by flow measurements

1320 - Arrive @ KRY-200 sample  
location Per M. Buey area  
has been changed since previous  
visit - lots of rocks & wood debris  
piled up -

- located sampling stake  
& discussed sampling strategy.  
Sample low flow sample will  
be collected from stagnant  
area adjacent to stake. Flow &  
medium & high flow samples  
will be collected off point  
in line with sample stake -

1345 - Arrive @ KRY-200 just  
downstream of bridge - middle  
of River is too deep for wading  
at stake location. Decided would  
access part of river from far



1455-Airloc © KRR-202

Dist on Tape	width	Total Depth	Vol	Area	Velocity	Area
6	2	.5	0	1.0	0	1.0
8	2	.3	.55	.6	.55	.6
10	2	.25	.18	.5	.18	.5
12	2	.33	.32	.7	.32	.7
14	2	.20	0	.4	0	.4
16	2	.50	2.02	1.0	2.02	1.0
18	2	.8	.81	1.6	1.31	1.6
20	2	1.23	3.54	2.5	3.54	2.5
22	2	.91	2.71	1.8	2.71	1.8
24	2	1.3	2.84	2.6	2.84	2.6
26	2	1.3	4.74	2.6	4.74	2.6
28	2	1.3	4.77	2.6	4.77	2.6
30	2	1.6	5.11	2.0	5.11	2.0
32	2	.75	4.24	1.5	4.24	1.5
34	2	.75	3.33	1.5	3.33	1.5
36	2	.6	3.95	1.2	3.95	1.2
38	2	.7	3.87	1.4	3.87	1.4
40	2	.6	2.49	1.2	2.49	1.2
42	2	.55	2.82	1.3	2.82	1.3
44	2	.5	2.97	1.0	2.97	1.0
46	2	.35	1.35	.7	1.35	.7
50	2	.54	1.31	.8	1.31	.8
54	2	.2	1.44	.5	1.44	.5

Discharge

0  
 .33  
 .09  
 .224  
 0  
 2.02  
 2.096  
 8.85

~~10/9/77~~  
~~10/9/77~~  
~~10/9/77~~



Left Bank-108  
Right Bank-49.

Discharge

0  
0.14  
.4  
.612  
.887  
1.48  
2.16  
3.97  
4.32  
5.28  
6.53  
7.92  
11.16  
11.44  
11.44  
~~8.48~~ 11.41  
8.492 8.48  
5.412 3.192  
5.04 .112  
5.128 .09  
1.28  
0.00

> Medium-  
30-34

> High  
20-24

1455-Arrow @ KRP-202	Area	Per 1000	Area	Per 1000
Type nos	Width	Depth	Vac	Depth
49	2	.65	0	0
47	2	.3	.35	.35
45	2	.4	.50	.50
43	2	.6	.51	.51
41	2	.725	.57	.57
39	2	1.0	.74	.74
37	2	1.4	.95	.95
35	2	1.6	1.24	1.24
33	2	1.5	1.44	1.44
31	2	1.5	1.76	1.76
29	2	1.7	1.92	1.92
27	2	1.8	2.20	2.20
25	2	2.0	2.79	2.79
23	2	2.0	2.86	2.86
21	2	1.9	3.00	3.00
19	2	1.75	3.26	3.26
17	2	1.35	3.14	3.14
15	2	.7	2.28	2.28
13	2	.7	.16	.16
11	2	.5	.09	.09
9	2	.3	.08	.08
7	2	.3	.04	.04
5	2	.3	.00	.00
3	2	.3	.00	.00
1	2	.3	.00	.00



photo #4 - KR4-202 Board  
 photo #6 } Picture of area where  
 photo #7 } flow measured  
 photo #5 - low flow area - not measured

Flow sheet was filled out  
 for area

Tape measure on far bank

1640 M. Bay off-site

1700 Arrive @ KR4-203  
 Residents present - let them know  
 we are sampling -

photo #8 - KR4-203 Board  
 photo #9 - Area of low flow  
 photo #10-11 - Picture of area where  
 flow measured

Flow sheet filled out at sample  
 site  
 Left Bank - 6' Right Bank - 55'  
 Tape measure on far bank  
 1750 off-site for day

Tape	Width	Total Depth	Area	Discharge
6	2	.5	1.0	0
8	2	.3	.6	.33
10	2	.25	.5	.49
12	2	.35	.7	.224
14	2	.20	.4	0
16	2	.50	1.0	.202
18	2	.8	1.6	.210
20	2	1.25	2.5	.885
22	2	.9	1.8	.648
24	2	1.3	2.6	.648
26	2	1.3	2.6	11.54
28	2	1.3	2.6	12.42
30	2	1.0	2.0	10.22
32	2	.75	1.5	6.36
34	2	.75	1.5	4.95
36	2	.6	1.2	4.74
38	2	.7	1.4	5.48
40	2	.6	1.2	2.88
42	2	.65	1.3	3.44
44	2	.5	1.0	2.97
46	2	.5	1.0	1.31
50	2	.35	.7	.945
54	2	.4	.8	1.018
54	2	.4	.8	1.162
54	2	.2	.4	0



Sampling SW/SED 10/10/07

0915 Arrive @ site after  
errands

B. Hollamon } PTS  
J. Flammang }

calm, cloudy, SWF

Safety mfg.

- Watch Safety
- Watch footing while trying to  
get sediment
- Unseen footing while carrying  
equipment
- Multiple trips
- Watch equipment in yard -

Calibrate meters

pH 4.01 → 4.02  
700 → 7703  
1000 → 10.04  
slp - 92.5  
SC 1413 us/cm standard → 1416 us/cm  
OH 476.1 mV likes soln → 474.2 mV  
DO 200' 200% salinity

Arrive @ KRY-203 + KRY-303

950 Collect KRY-203-A

- low velocity SW sample <sup>collected</sup>  
2-1 L amber glass, Dioxin flurans - Raw  
1- 1L HDPE plastic, TSS, Raw  
500 ml HDPE

pH Temp SC CH DO  
7.25 9.2 275 187.1 7.31

1000 Collect KRY-203-B

- medium velocity sample  
- collected from 35' <sup>erect bank,</sup>  
2- 1 L amber glass, Raw <sup>tape measure</sup>  
1- 1L HDPE, TSS, Raw <sup>exact</sup>  
500 ml <sup>distance</sup>

pH Temp SC CH DO

8.10 8.7 312 174.3 9.36

1010 Collect KRY-203-C

- High velocity flow sample  
2- 1 L amber glass, Raw  
1- 1L HDPE, TSS, Raw  
500 ml



KRY-203-C cont.

- sample collected @ 28' from access bank, tape measure read 6' @ bank, sample collected @ 22' from access bank
- All 3 samples collected by submerging bottle into flow approximately 1/2 the depth & then slowly raising. HDPE bottles rinsed 3x prior to filling

1015 Collected KRY-203-A

- low velocity flow sediment
- 1-8 oz amber, Dioxin
- 1-4 oz amber, TOC
- sample collected at 35' from access bank, tape read 4' @ bank so 1/2 bot sample collected @ 25' from bank

1020 Collected KRY-203-B

- medium velocity flow sediment
- 1-8 oz amber, Dioxin
- 1-4 oz amber, TOC
- sample collected @ 22-24' from access bank, tape read 5' @
- access bank sample actually collected 26-31' from bank

1045 Collected KRY-203-C

- high velocity flow sediment
- 1-8 oz amber, Dioxin (1/3 bottles)
- 1-4 oz amber, TOC (1/2 bottles)
- sample collected @ 27-35' from access bank, tape measure read 6' @ access bank 21-24' from access bank
- Collected low sample from bank area adjacent to bank in low flow

KRY-203-A  
photo "g" toothy site  
sample  
9-KRY-203-C  
10-KRY-203-B  
sample site



Collected KRY-203A - separate flow

KRY-203C 26-30' access

KRY-203B KRY-203C

KRY-203A  
KRY-203B

KRY-203-C parameters

PA Temp SC Eh DO

7.93 8.8 318 148.2 8.09



~~Arrive @ KRY-202~~

Used stainless steel scoops to collect sample. Attempted to collect KRY-303-C prior to B but did not have luck collecting any sediment. Collected KRY-303-B in approximately an hour - a returned to KRY-303-C site - managed to collect 1/2 of the dioxin bottle - sediment was fairly coarse - River bottom composed mainly of large cobbles & smaller gravel - Very little fine sediment available. Tried for approximately 1/2 hour and time - so a total of approximately an hour to get sample.  
- Decon equipment - tap water / soap wash  
1305 Arrive @ KRY-302 / KRY-202 parking location.  
1315 Arrive @ sampling pt on river

1325 Collect KRY-202-A  
- low flow SW sample

KRY-202-A cont

2-1 L amber jars, Dioxin, Raw  
1-1500 ml, Raw, TSS  
- collected from stagnant (slight flow) from near bank. M. Buey  
may have thought may have sampled there originally

PH	Temp	SC	chl	DO
7.87	11.2	300	100.8	8.32

1335 Collect KRY-202-C

- high velocity flow SW sample  
2-1 L amber jars, Dioxin, Raw  
1-1500 ml, Raw TSS  
sample collected @ 22' from access stream bank. Tape measure read 1.8', so sample collected at 20.2' from bank  
PH Temp SC chl DO

8.07	10.1	317	74.9	8.28
------	------	-----	------	------



1345 Collected KRY-202-B

medium velocity flow SW sample

2-1 L amber glass, Raw, Dioxin

1-500 ml HDPE, Raw, TSS

collected at 3'2" from access

Stream bank. Tape measure read

1.8', so actually collected at

photo "11-Read 30.2" from bank

12- KRY-202-A sample loc

13- KRY-202-C sample loc

14- KRY-202-B sample loc

All 3 samples collected by submerging  
bottle into flow approximately  
1/2 the depth & raising slowly.  
HDPE - bottle rinsed 3 times prior  
to filling

PH	Temp	SC	EL	DO
8.49	10.1	301	4.3	8.57

1400 Collected KRY-202-A

low velocity flow sediment

1-1 L amber glass, Dioxin,

1-4 oz amber glass, TOC

- collected stagnant area (slight flow)

near original sample stake

- 2 seaweed, organic layer-silt

- below silt u. gravimed sand

quite a bit of soil present - no  
rocks

- used stainless steel scoop

collected in disposable aluminum

pan. mixed placed in jars

1430 Collected KRY-302-C

- high velocity flow sediment sand

1- 8 oz amber glass, Dioxin

1- 4 oz amber glass, TOC

- collected @ 22' ~~from~~ 25' from

access bank, tape read 11.8', so actually

collected at 20.2-23.2'

- mostly cobbles very little fine

sediment - sediment was med

grained sand

- jars were both filled 3/4 of the

way

- used sediment cover to obtain

sample, placed in disposable

al pan, cleaned w/ DI hexanes

mixed & placed in containers



# 1500 Collect KRY-302-B

- medium velocity flow sediment sample

1-8 oz amber glass, Dioxin

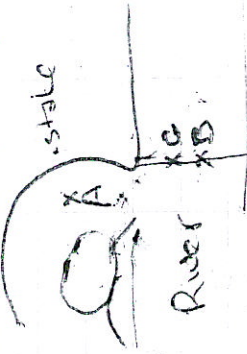
1-4 oz amber glass, TOC

- sample collected 32'-35' from

depos bank, ~~33' measured~~ 18'

at across bank sample actually collected

at 30.2-33.2'



- used stainless

steel scoop placed

sediment in

disposable foil pan

mixed & placed in

bags after pulling

out by rocks & excess water

- sediment was med to coarse sand

1520s very sparse amidst cobbles

1515 leave KRY-202/302 area

1520 Arrive @ KRY-200/300 area

- Decon equipment

tap water, rinse, soap water wash

tap rinse, DI rinse, triple hexane rinse

wrap in foil - steel washing pans

Arrive @ KRY-200 sample site

1600 Collect KRY-200-A

low velocity slow sample

1-11L Amber glass, Dioxin, Raw

1-1500ml, HDPE, TSS, Raw

- Collected @ 9' from access bank on

tape measure - starting at 5.7' = 3.3' from bank

KRY-200-A

Parameters

pH Temp SC Eh DO

8.27 10.4 305 54.28.66

KRY-200-B

Parameters

8.53 9.8 302 57.6 8.09

KRY-200-C

Parameters

8.53 9.8 317 18.3 8.12

KRY-205 - Duplicate Sample

@ KRY-200-A



11610 - Collect KRY-200-B

- medium flow velocity sw sample
- 2-1 L amber glass, Dioxin, Raw
- 1- ~~300~~ mL HDPE, TSS, Raw
- collected @ 23.5' from access bank, tape measure, edge of water @ 5.7' ± 17.8' from bank sampled

11620 - Collect KRY-200-C

- high flow velocity sw sample
- 2-1 L amber glass, Dioxin, Raw
- 1-1 L HDPE, TSS, Raw
- collected @ 32.5' from access bank on tape measure, edge of water @ 5.7' so sampled at 24.8'

photo # 15 - Bank

- 116 - low velocity flow - (200A)
- 17 med velocity flow - (200B)
- 13 hi velocity flow - (200C)

All 3 samples collected by submerging bottles directly into River - approximately 1.5' below water level for med high flow samples & slowly raising

bottle to surface. HDPE bottle rinsed 3x prior to sampling

KRY-205 collected at same time as KRY-200-A

DUPLICATE SAMPLE

- bottles were labeled with 1700 time for blind duplicate
- 2-1 L amber glass, Dioxin, Raw
- 1-1 L HDPE, TSS, Raw

sample collected at same time as KRY-200-A. Bottles were filled alternately during sample event

11630 - Collect KRY-300-A

- low velocity flow sediment sample
- 1-2 oz amber glass, Dioxin
- 1-4 oz amber glass, TOC
- collected @ 9' from access bank on tape measure, edge of water was at 5.7', sampled at 1' from bank

fine silt & fgs sand mixed with wood cut by beavers



-collected w/ stainless steel trowel  
a placed in disposable foil pan  
mixed placed in containers

### 1700 - Collected KRP-300-B

medium velocity flow sediment sample  
1-2 oz amber glass, Dioxin  
1-4 oz amber glass, TOC  
-sample collected at  $21.5 \pm 0.5$  from access  
bank on tape measure, access bank at  
5.7', collected @ 15.8-19.8' from bank  
-sample collected w/ sediment borer  
into disposable aluminum pan  
mixed & placed in bottles.

-sediment was coarse sand squared  
w/ some algae. Algae appeared to  
coat large cobbles in active flow  
areas at this location

### 1730 Collected KRP-300-C

high velocity flow sediment sample  
1-2 oz amber glass, Dioxin  
1-4 oz amber glass, TSS  
-sample collected @  $30.5 \pm 0.5$  from access  
bank, 5.7' on tape measure @ access

23.3'-  
bank, sample collected @ 25.3' from  
access bank, to deep to go further into river  
-sample collected w/ sediment corer  
into aluminum disposable pan mixed  
& placed in containers  
-sediment was med to coarse  
sand w/ gravel - w/ algae. River  
bottom was cobbles coated  
w/ algae.

~~1800~~ Decon equipment w/ tap  
rinse, soap wash, tap rinse, DI rinse  
hexane rinse

1800 Collect KRP-204  
Equipment Rinse  
2.1 L amber glass, Dioxin, PAH

Type II Reagent water poured  
down stainless steel trowel  
used for sampling @ KRP-200-A  
plus others into appropriate  
containers



1830 collect KRY-200

BOTTLE BLANK

2-1 L Amber glass, Dioxin, Raw  
poured Type II Reagent water  
directly into containers

1815-Took 13 pictures of treated  
poles present on Kalspell Pole  
Site per M. Buey request--

1840- Off site for day

Tracking off for Energy  
Cooler

REF # / DATE

12 45W A80 06 0009 6102

GROUND A.R.S. TRACKING NUMBER





# OPEN CHANNEL PROFILING FORM

Portable Flow Meter Used Marsh McBurney  
 Left Bank 6 Right Bank 55

Location KR 4-203  
 Recorder F  
 Gauge BN  
 Date 10/9/07  
 Time 1700  
 Page \_\_\_\_\_ of \_\_\_\_\_

	Distance from IP	Width	Total Depth	V0.6	V0.2	V0.8	V0.9	Average Velocity	Area	Discharge (Ave V*A)
1	6	2	.5	0				0	1.0	0
2	8	2	.3	.55				.55	.6	.33
3	10	2	.25	.18				.18	.5	.09
4	12	2	.35	.32				.32	.7	.224
5	14	2	.20	0				0	1.64	0
6	16	2	.50	2.02				2.02	1.0	2.02
7	18	2	.8	1.31				1.31	1.6	2.10
8	20	2	1.25	3.54				3.54	2.5	8.85
9	22	2	.9	3.71				3.71	1.8	6.68
10	24	2	1.3	2.34				2.34	2.6	6.08
11	26	2	1.3	4.44				4.44	2.6	11.54
12	28	2	1.3	4.77				4.77	2.6	12.40
13	30	2	1.0	5.11				5.11	2	10.22
14	32	2	.75	4.24				4.24	1.5	6.36
15	34	2	.75	3.33				3.33	1.5	4.995
16	36	2	.6	3.95				3.95	1.2	4.74
17	38	2	.7	3.87				3.87	1.4	5.418
18	40	2	.6	2.49				2.49	1.2	2.988
19	42	2	.65	2.82				2.82	1.3	3.666
20	44	2	.5	2.97				2.97	1.0	2.97
21	46	2	.5	1.59				1.59	1.0	1.59
22	48	2	.35	1.35				1.35	.7	0.945
23	50	2	.4	1.31				1.31	.8	1.048
24	52	2	.4	1.44				1.44	.8	1.152
25	54	2	.2	0				0	.4	0
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total Discharge (cfs)										

V 0.6 for stream depths between 0.3 & 2.5 feet  
 (V 0.2 + V 0.8)/2 for stream depths greater than 2.5 feet  
 V0.9 if flow is less than 0.3 feet (Maximum velocity x 0.9)

Staff Gauge (ft) Beginning \_\_\_\_\_ End \_\_\_\_\_  
 Stream Flow Conditions \_\_\_\_\_  
 Weather Conditions \_\_\_\_\_



# OPEN CHANNEL PROFILING FORM

Portable Flow Meter Used Marsh McBirney

Left Bank 1.8 Right Bank 49

Location KRY-2002  
 Recorder JF  
 Gauge BH  
 Date 10/9/07  
 Time 1855  
 Page \_\_\_\_\_ of \_\_\_\_\_

	Distance from IP	Width	Total Depth	V0.6	V0.2	V0.8	V0.9	Average Velocity	Area	Discharge (Ave V*A)
1	49		.05	0				0	2	0
2	47	2	.2	.35				.35	2.4	.14
3	45	2	.4	.50				.50	.8	.40
4	43	2	.6	.51				.51	1.2	.612
5	41	2	.725	.57				.57	1.45	.827
6	39	2	1.0	.74				.74	2.0	1.48
7	37	2	1.4	.95				.95	2.8	2.66
8	35	2	1.6	1.24				1.24	3.2	3.97
9	33	2	1.5	1.44				1.44	3.0	4.32
10	31	2	1.5	1.76				1.76	3.0	5.28
11	29	2	1.7	1.92				1.92	3.4	6.53
12	27	2	1.8	2.20				2.2	3.6	7.92
13	25	2	2.0	2.79				2.79	4.0	11.16
14	23	2	2.0	2.86				2.86	4.0	11.44
15	21	2	1.9	3.00				3.00	3.8	11.44
16	19	2	1.75	3.26				3.26	3.5	11.41
17	17	2	1.35	3.14				3.14	2.7	8.48
18	15	2	.7	2.28				2.28	1.4	3.192
19	13	2	.7	.116				.116	1.4	.112
20	11	2	.5	.09				.09	1.0	.09
21	9	2	.8	.08				.08	1.6	.128
22	7	2	.8	.07				.07	1.6	.056
23	5	2	.4	0				0		
24	3	2	.5	0				0	1.0	
25	1.8	2	.85	0						
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										

Total Discharge (cfs)

V 0.6 for stream depths between 0.3 & 2.5 feet  
 (V 0.2 + V 0.8)/2 for stream depths greater than 2.5 feet  
 V0.9 if flow is less than 0.3 feet (Maximum velocity x 0.9)

Staff Gauge (ft) Beginning \_\_\_\_\_ End \_\_\_\_\_

Stream Flow Conditions \_\_\_\_\_

Weather Conditions \_\_\_\_\_



# OPEN CHANNEL PROFILING FORM

Portable Flow Meter Used Marsh McBurney

Left Bank 64.5

Right Bank 5.7

Location KRY-200  
Recorder J  
Gauge BH  
Date 10/9/07  
Time 1400  
Page \_\_\_\_\_ of \_\_\_\_\_

	Distance from IP	Width	Total Depth	V0.6	V0.2	V0.8	V0.9	Average Velocity	Area	Discharge (Ave V*A)
1	64.5	2	0.05	0				0		0
2	62.5	2	0.2	0				0		0
3	60.5	2	0.6	0				0		0
4	58.5	2	0.95	0				0		0
5	56.5	2	1.6	0				0.08	4.2	0.336
6	54.5	2	2.1	0.08				0.20	5.0	1.00
7	52.5	2	2.5	0.20				0.31	6.5	2.015
8	50.5	2	3.25	—	0.42	0.20		0.305	7.4	2.704
9	48.5	2	3.7	—	0.56	0.17		0.475	8.6	4.085
10	46.5	2	4.3	—	0.53	0.42		0.59		
11	42.5		4.25		0.61	0.57		0.585	7.85	4.59
12	38.5	2	3.925		0.56	0.61		0.606	7.2	3.816
13	38.5	2	3.6		0.49	0.57		0.515	6.5	3.35
14	26.5	2	3.25		0.53	0.50		0.445	5.8	2.58
15	24.5	2	2.9		0.52	0.37		0.405	5.3	2.15
16	22.5	2	2.65		0.42	0.39		0.40	4.8	1.92
17	20.5	2	2.4	0.40				0.43	4.4	1.89
18	18.5	2	2.2	0.43				0.39	4.0	1.56
19	16.5	2	2.0	0.39				0.34	3.6	1.224
20	14.5	2	1.8	0.34				0.33	2.7	0.891
21	12.5	2	1.35	0.33				0.26	1.6	0.416
22	10.5	2	0.8	0.26				0.22	1.6	0.352
23	8.5	2	0.8	0.22						
24	6.5	2	0.8	0.19						
25	5.7									
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Total Discharge (cfs)										

V 0.6 for stream depths between 0.3 & 2.5 feet  
(V 0.2 + V 0.8)/2 for stream depths greater than 2.5 feet  
V0.9 if flow is less than 0.3 feet (Maximum velocity x 0.9)

Staff Gauge (ft) Beginning \_\_\_\_\_ End \_\_\_\_\_  
Stream Flow Conditions \_\_\_\_\_  
Weather Conditions \_\_\_\_\_



## **STATISTICAL ANALYSIS REPORTS**



## ONE-WAY AOV FOR TEF BY LOCATION

SOURCE	DF	SS	MS	F	P
BETWEEN	2	0.57405	0.28702	3.27	0.1097
WITHIN	6	0.52730	0.08788		
TOTAL	8	1.10134			

	CHI-SQ	DF	P
BARTLETT'S TEST OF EQUAL VARIANCES	0.75	2	0.6865

COCHRAN'S Q	0.4631
LARGEST VAR / SMALLEST VAR	3.8080

COMPONENT OF VARIANCE FOR BETWEEN GROUPS	0.06638
EFFECTIVE CELL SIZE	3.0

LOCATION	MEAN	SAMPLE SIZE	GROUP STD DEV
Downstream	3.4243	3	0.3494
Onsite	2.8940	3	0.3309
Upstream	2.8833	3	0.1791
TOTAL	3.0672	9	0.2964

CASES INCLUDED 9      MISSING CASES 0

## TUKEY (HSD) COMPARISON OF MEANS OF TEF BY LOCATION

LOCATION	MEAN	HOMOGENEOUS GROUPS
Downstream	3.4243	I
Onsite	2.8940	I
Upstream	2.8833	I

THERE ARE NO SIGNIFICANT PAIRWISE DIFFERENCES AMONG THE MEANS.

CRITICAL Q VALUE	4.341	REJECTION LEVEL	0.050
CRITICAL VALUE FOR COMPARISON	0.7431		
STANDARD ERROR FOR COMPARISON	0.2421		

95% confidence



## ONE-WAY AOV FOR TEF BY FLOW

SOURCE	DF	SS	MS	F	P
BETWEEN	2	0.37181	0.18591	1.53	0.2906
WITHIN	6	0.72953	0.12159		
TOTAL	8	1.10134			

	CHI-SQ	DF	P
BARTLETT'S TEST OF EQUAL VARIANCES	1.81	2	0.4047

COCHRAN'S Q	0.7408
LARGEST VAR / SMALLEST VAR	6.5051

COMPONENT OF VARIANCE FOR BETWEEN GROUPS	0.02144
EFFECTIVE CELL SIZE	3.0

FLOW	MEAN	SAMPLE SIZE	GROUP STD DEV
High Veloc	3.2963	3	0.2302
Low Veloci	2.8023	3	0.2038
Medium Vel	3.1030	3	0.5198
TOTAL	3.0672	9	0.3487

CASES INCLUDED 9      MISSING CASES 0

## TUKEY (HSD) COMPARISON OF MEANS OF TEF BY FLOW

FLOW	MEAN	HOMOGENEOUS GROUPS
High Veloc	3.2963	I
Medium Vel	3.1030	I
Low Veloci	2.8023	I

THERE ARE NO SIGNIFICANT PAIRWISE DIFFERENCES AMONG THE MEANS.

CRITICAL Q VALUE	4.341	REJECTION LEVEL	0.050
CRITICAL VALUE FOR COMPARISON	0.8740		
STANDARD ERROR FOR COMPARISON	0.2847		

*95% confidence*

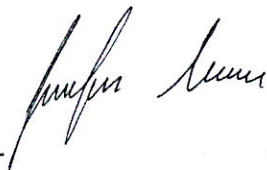


## **DATA VALIDATION REPORTS**

**Kalispell Pole and Timber Yard Reliance and Yale Oil**

**SDG#:** H07100177  
**Number of Samples:** 10  
**Sample Matrix:** Water  
**Applicable Analytes:** Total Suspended Solids (TSS)  
**Reporting Tier:** 3  
**Applicable TOS#:** N/A  
**Laboratory:** Energy Laboratories  
**Validation Level:** EPA Level III  
**Validator Affiliation:** Portage Environmental, Inc.  
**Project#:**

**Validator:** \_\_\_\_\_



**Date Completed:** 11/30/07

**Portage Review:** \_\_\_\_\_



**Date Completed:** 11/30/07



**REPORT ORGANIZATION:**

Limitations & Validation (L&V) Report Kalispell Pole and Timber Reliance and Yale Oil (KRY) is organized into the following five sections:

- Glossary of Terms & Method References
- Data Quality Statement
- L&V Report
- Attachment A: Laboratory Report Forms Corrected for Qualification

**GLOSSARY OF VALIDATION TERMS & METHOD VALIDATION REFERENCES****Terms:**

<b>CRDL</b>	Contract Required Detection Limit
<b>IDL</b>	Instrument Detection Limit
<b>SOW</b>	Statement of Work
<b>SOP</b>	Standard Operating Procedure
<b>MS</b>	Matrix Spike
<b>MSD</b>	Matrix Spike Duplicate
<b>ICV</b>	Initial Calibration Verification
<b>CCV</b>	Continuing Calibration Verification
<b>ICB</b>	Initial Calibration Blank
<b>CCB</b>	Continuing Calibration Blank
<b>PB</b>	Preparation Blank
<b>LCS</b>	Laboratory Control Sample
<b>SDS</b>	Serial Dilution Sample
<b>SDG</b>	Sample Delivery Group

**Qualifiers:**

- U -** The material was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.  
**Note:** This detection limit may be elevated to a level greater than the IDL due to a detection of a target compound in the method blank, and as a result, the sample value, which was less than ten times the blank result, has been qualified 'U' as a non-detect.
- J -** The analyte was positively identified in the sample, but the associated numerical value may not be an accurate representation of the amount actually present in the environmental sample. The data should be seriously considered for decision-making and are usable for many purposes.
- R -** The data are unusable (may or may not be present). Resampling and reanalysis are necessary for verification.
- UJ -** The material was analyzed for but was not detected. The sample quantitation limit is an estimated quantity.

**Reference:**

The validation of this data was performed according to:

1. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA540/R-94/013, February 1994.*
2. *USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis, Multi-Media, Multi-Concentration, Document Number ILM04.0, January 2000.*



## **LIMITATIONS AND VALIDATION REPORT**

### **INTRODUCTION:**

The Kalispell Pole and Timber Reliance and Yale Oil (KRY) water sample results were received by Portage Environmental, Inc. in November 2007. The laboratory analytical request provided for a full deliverable and a summary data package attached for the pH results. The samples were analyzed in accordance with Standard Method 2540D. Data validation was performed utilizing the USEPA Functional Guidelines for Inorganic Data Review. The following cross-reference has been provided to assist data users in comparing field identifications to the corresponding laboratory numbers.

<b>Cross-Reference for Kalispell Pole and Timber Reliance and Yale Oil (KRY) Water for TSS Samples</b>					
<b>Field Id#:</b>	<b>Lab Id#:</b>	<b>Matrix:</b>	<b>Analysis Request:</b>	<b>Date of Collection:</b>	<b>Date of Laboratory Receipt:</b>
KRY-200-A	H07100177-001	Water	TSS	10/10/07	10/15/07
KRY-200-B	H07100177-002	Water	TSS	10/10/07	10/15/07
KRY-200-C	H07100177-003	Water	TSS	10/10/07	10/15/07
KRY-202-A	H07100177-004	Water	TSS	10/10/07	10/15/07
KRY-202-B	H07100177-005	Water	TSS	10/10/07	10/15/07
KRY-202-C	H07100177-006	Water	TSS	10/10/07	10/15/07
KRY-203-A	H07100177-007	Water	TSS	10/10/07	10/15/07
KRY-203-B	H07100177-008	Water	TSS	10/10/07	10/15/07
KRY-203-C	H07100177-009	Water	TSS	10/10/07	10/15/07
KRY-205	H07100177-010	Water	TSS	10/10/07	10/15/07

### **ANALYTICAL HOLDING TIMES:**

The surface water samples associated with this SDG were collected on 10/10/07. The TSS results were analyzed on 10/15/06. The analysis occurred within the 7-day holding time for TSS results.

### **LABORATORY DUPLICATE SAMPLE (LDS) RPD:**

All LDS and field duplicate (KRY-205) results were within the RPD criteria prescribed by the USEPA Functional Guidelines and the analytical methods.

**LABORATORY CONTROL SAMPLE (LCS):**

All analytes exhibited recoveries within the guidelines prescribed by the USEPA Functional Guidelines and analytical methods.

**CHAIN OF CUSTODY:**

The laboratory chain of custody forms are complete and accurate.

**OVERALL ASSESSMENT OF DATA:**

There were ten (10) water samples included in SDG# H07100177. Each was analyzed for TSS as outlined in the project QAPP.

The field sample data points have been assessed and remain unqualified..



## **Attachment A: Laboratory Report Forms**



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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-001  
Client Sample ID: KRY-200-A

Report Date: 10/18/07  
Collection Date: 10/10/07 16:00  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:14 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-002  
Client Sample ID: KRY-200-B

Report Date: 10/18/07  
Collection Date: 10/10/07 16:10  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:14 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-003  
Client Sample ID: KRY-200-C

Report Date: 10/18/07  
Collection Date: 10/10/07 16:20  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:15 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-004  
Client Sample ID: KRY-202-A

Report Date: 10/18/07  
Collection Date: 10/10/07 13:25  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:15 / sid

Report Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-005  
Client Sample ID: KRY-202-B

Report Date: 10/18/07  
Collection Date: 10/10/07 13:45  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:16 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-006  
Client Sample ID: KRY-202-C

Report Date: 10/18/07  
Collection Date: 10/10/07 13:35  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:16 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-007  
Client Sample ID: KRY-203-A

Report Date: 10/18/07  
Collection Date: 10/10/07 09:50  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:16 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-008  
Client Sample ID: KRY-203-B

Report Date: 10/18/07  
Collection Date: 10/10/07 10:00  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:17 / sld

Report Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-009  
Client Sample ID: KRY-203-C

Report Date: 10/18/07  
Collection Date: 10/10/07 10:10  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:17 / slt

Report Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-010  
Client Sample ID: KRY-205

Report Date: 10/18/07  
Collection Date: 10/10/07 17:00  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:17 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.

## Kalispell Post & Timber

1. SDG Number: 1060842
2. Number of Samples: (12)
3. Sample Matrix: (12) Groundwater
4. Applicable Analytes: PCDD/PCDF
5. Reporting Tier: Level 3
6. Analysis Method USEPA SW-846 Method 8290
7. Laboratory: Pace Analytical
8. Validation Level: III
9. Validator Affiliation: Portage Environmental, Inc.
10. Project: Kalispell Post & Timber

Validator's Signature:

*Amber Brinkley*

Date: 11/29/07

Reviewed By:

*[Signature]*

Date: 11/30/07



## 1. INTRODUCTION

Twelve (12) groundwater samples were collected and analyzed for Dioxins/Furans by Pace Analytical using USEPA SW-846 Method 8290, *Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS)*. The data were validated to a Level III.

## 2. SAMPLE IDENTIFICATION

A sample cross-reference and holding time table is presented below.

Kalispell Post & Timber SDG Number 1060842								
Field ID	Lab ID	Matrix	Sample Collection Date	Date Received	Date Extracted	Collection to Extraction Holding Time	Analysis Date	Extraction to Analysis Holding Time
KRY-200-A	1060842001	Groundwater	10/10/07	10/12/07	10/31/07	21	11/02/07	2
KRY-200-B	1060842002	Groundwater	10/10/07	10/12/07	10/31/07	21	11/02/07	2
KRY-200-C	1060842003	Groundwater	10/10/07	10/12/07	10/31/07	21	11/02/07	2
KRY-202-A	1060842004	Groundwater	10/10/07	10/12/07	10/31/07	21	11/02/07	2
KRY-202-B	1060842005	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-202-C	1060842006	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-203-A	1060842007	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-203-B	1060842008	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-203-C	1060842009	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-204 (Equipment Rinsate)	1060842010	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-205	1060842011	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3
KRY-206 (Bottle Blank)	1060842012	Groundwater	10/10/07	10/12/07	10/31/07	21	11/03/07	3

A '\*' denotes an exceeded holding time.

## 3. DATA LIMITATION OVERVIEW

The target compound analyses, dioxin/furan, for groundwater samples from Kalispell Post & Timber showed compliance with the QC requirements set forth by USEPA SW-846 Method 8290. The data are valid and acceptable with the following exceptions:

### KRY-200-A:

- 1,2,3,4,6,7,8-HpCDD and OCDF have been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

- OCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

KRY-200-B:

- Total HpCDF has been qualified with a 'J' validation flag to denote the reported concentration is an estimate as it was reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- total HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the bottle blank (see CTR comment #6).
- OCDF and OCDD have been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

KRY-200-C:

- 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD have been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

KRY-202-A:

- OCDF and OCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

KRY-202-B:

- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- Total HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the bottle blank (see CTR comment #6).



- OCDD has been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

KRY-202-C:

- 1,2,3,4,6,7,8-HpCDD and OCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- Total HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the bottle blank (see CTR comment #6).
- OCDF has been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

KRY-203-A:

- Total HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the bottle blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- 1,2,3,4,6,7,8-HpCDF has been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect, and the sample quantitation limit is an estimate due to positive detection in the bottle blank and interference in the sample (see CTR comments #6 and 10).
- OCDD has been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

KRY-203-B and KRY-204 (Equipment Rinsate):

- OCDD has been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

KRY-203-C:

- OCDD has been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).

KRY-205:

- 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF have been qualified with a 'UJ' validation flag to denote the reported EMPC results are non-detect, and the sample quantitation limits are estimates due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).
- 1,2,3,4,6,7,8-HpCDF has been qualified with a 'UJ' validation flag to denote the reported EMPC is non-detect, and the sample quantitation limit is an estimate due to positive detection in the bottle blank and interference in the sample (see CTR comments #6 and 10).
- 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, and OCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).

KRY-206 (Bottle Blank):

- 1,2,3,4,6,7,8-HpCDF has been qualified with a 'J' validation flag to denote the reported EMPC is an estimate due to interference in the sample (see CTR comment #10).
- Total HpCDD has been qualified with a 'J' validation flag to denote the reported concentration is an estimate as it was reported below the quantitation limit (see CTR comment #10).
- 1,2,3,4,6,7,8-HpCDD and OCDD have been qualified with a 'U' validation flag to denote the reported concentration is non-detect due to positive detection in the method blank (see CTR comment #6).
- OCDF has been qualified with a 'UJ' validation flag to denote the reported EMPC result is non-detect, and the sample quantitation limit is an estimate due to positive detection in the method blank and interference in the sample (see CTR comments #6 and 10).



#### 4. CONTRACT AND TECHNICAL REVIEW (CTR)

Project Name: Kalispell Post & Timber  
Laboratory Name: Pace Analytical  
SDG#: 1060842  
Type of Analysis: USEPA SW-846 Method 8290

1. Data Completeness

The data has undergone a Level III validation.

2. Sample Integrity

No action was taken as sample integrity was compliant.

3. Sample Holding Times

No action was taken as sample holding times were met.

4. Instrument Performance

No action was taken as instrument performance was compliant.

5. Initial and Continuing Calibrations

The initial and continuing calibration forms were not included in the data package as it was a level III. This was acceptable, per Montana Department of Environmental Quality. The laboratory noted in the case narrative, "the response obtained for native OCDF in calibration standard analysis F71102B\_18 was outside the target range." The laboratory flagged the affected values on the Form 1s with a 'Y'. All positive OCDF results were qualified with a 'U' validation flag due to positive detection in the method blank and all EMPC OCDF results were qualified with a 'UJ' validation flag due to positive detection in the method blank and interference in the sample. No further qualification was warranted due to the calibrations standard.

6. Method and Field Blank Contamination

**Method Blank.** Positive detections were noted in the method blank for 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, Total HxCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD. 1,2,3,4,7,8-HxCDF in KRY-205, 1,2,3,4,6,7,8-HpCDD in KRY-200-A, KRY-200-C, and KRY-205, OCDF in KRY-200-A, KRY-200-B, KRY-200-C, KRY-202-C, KRY-205, and KRY-206, and OCDD in KRY-200-B, KRY-200-C, KRY-202-B, KRY-203-A, and KRY-203-C exhibited detections at an estimated maximum possible concentration (EMPC) and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the blank value and interference was present in the sample. 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, total HxCDF, in KRY-205, OCDD in KRY-200-A, KRY-202-A, KRY-202-C, KRY-203-B, KRY-204, KRY-205, and KRY-206, 1,2,3,4,6,7,8-HpCDD in KRY-200-B, KRY-202-B, KRY-202-C, KRY-203-A, and KRY-206, and OCDF in KRY-202-A, have been qualified with a 'U' validation flag as the reported concentration was less than five times the blank value. All 1,2,3,6,7,8-HxCDF and 1,2,3,4,7,8-HxCDD results and the remaining 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, Total HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF results were non-detect and warrant no qualification due to detection in the method blank.

**Bottle Blank (KRY-206).** Positive detections were noted in the bottle blank (KRY-206) for 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD. 1,2,3,4,6,7,8-HpCDD and OCDD have already been qualified with a 'U' validation flag due to positive detections in the method blank. OCDF has been qualified with a 'UJ' validation flag due to detection in the method blank and interference within the sample. No further qualification is warranted. 1,2,3,4,6,7,8-HpCDF in KRY-203-A and KRY-205 exhibited detections at an estimated maximum possible concentration (EMPC) and have been qualified with a 'UJ' validation flag as the reported concentrations were less than five times the bottle blank value and as interference was present in the sample. Total HpCDD in KRY-200-B, KRY-202-B, KRY-202-C, and KRY-203-A has been qualified with a 'U' validation flag as the reported concentration was less than five times the bottle blank value. The remaining 1,2,3,4,6,7,8-HpCDF and total HpCDD results were non-detect and warrant no qualification.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD analysis was not required per USEPA SW-846 Method 8290. LCS and duplicate LCS analyses were performed instead.

8. Laboratory Control Sample (LCS)

No action was taken as all LCS and duplicate LCS recovery and precision criteria were met.



9. Internal Standards (IS) Performance

No action was taken as all internal standard recoveries were within the acceptance criteria.

10. Target Compound Identification and Quantitation

In KRY-200-A, 1,2,3,4,6,7,8-HpCDD and OCDF were reported at an EMPC as interference was noted in the sample for these analytes. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample.

In KRY-200-B, OCDF and OCDD were reported at an EMPC as interference was noted in the sample for these analytes. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample. Total HpCDF was reported below the quantitation limit. It has been qualified with a 'J' validation flag.

In KRY-200-C, 1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD were reported at an EMPC as interference was noted in the sample for these analytes. They have been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample.

In KRY-202-B, OCDD was reported at an EMPC as interference was noted in the sample for this analyte. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample.

In KRY-202-C, OCDF was reported at an EMPC as interference was noted in the sample for this analyte. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample.

In KRY-203-A, 1,2,3,4,6,7,8-HpCDD and OCDD were reported at an EMPC as interference was noted in the sample for these analytes. OCDD has been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample. 1,2,3,4,6,7,8-HpCDF has been qualified with a 'UJ' validation flag due to positive detection in the bottle blank and as interference was present in the sample.

In KRY-203-C, OCDD was reported at an EMPC as interference was noted in the sample for this analyte. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample.

In KRY-205, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF and OCDF were reported at an EMPC as interference was noted in the sample for these analytes. 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, and OCDF has been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample. 1,2,3,4,6,7,8-HpCDF has been qualified with a 'UJ' validation flag due to positive detection in the bottle blank and as interference was present in the sample.

IN KRY-206, OCDF was reported at an EMPC as interference was noted in the sample for this analyte. It has been qualified with a 'UJ' validation flag due to positive detection in the method blank and as interference was present in the sample. 1,2,3,4,6,7,8-HpCDF was reported at an EMPC as interference was noted in the sample for this analyte. It has been qualified with a 'J' validation flag. Total HpCDD was reported at a concentration below the quantitation limit. It has been qualified with a 'J' validation flag.

11. Chromatogram Quality

No comments relating to chromatogram quality.



## 5. SUMMARY OF DATA USABILITY

The data validation summary flag table shows that qualifiers were applied to the target analytes for SDG# 1060842.

DATA VALIDATION SUMMARY TABLE						
Compound	KRY-200-A	KRY-200-B	KRY-200-C	KRY-202-A	KRY-202-B	KRY-202-C
2,3,7,8-TCDF						
Total TCDF						
2,3,7,8-TCDD						
Total TCDD						
1,2,3,7,8-PeCDF						
2,3,4,7,8-PeCDF						
Total PeCDF						
1,2,3,7,8-PeCDD						
Total PeCDD						
1,2,3,4,7,8-HxCDF						
1,2,3,6,7,8-HxCDF						
2,3,4,6,7,8-HxCDF						
1,2,3,7,8,9-HxCDF						
Total HxCDF						
1,2,3,4,7,8-HxCDD						
1,2,3,6,7,8-HxCDD						
1,2,3,7,8,9-HxCDD						
Total HxCDD						
1,2,3,4,6,7,8-HpCDF						
1,2,3,4,7,8,9-HpCDF						
Total HpCDF		J				
1,2,3,4,6,7,8-HpCDD	UJ	U	UJ		U	U
Total HpCDD		U			U	U
OCDF	UJ	UJ	UJ	U		UJ
OCDD	U	UJ	UJ	U	UJ	U

DATA VALIDATION SUMMARY TABLE						
Compound	KRY-203-A	KRY-203-B	KRY-203-C	KRY-204 (Equipment Rinsate)	KRY-205	KRY-206 (Bottle Blank)
2,3,7,8-TCDF						
Total TCDF						
2,3,7,8-TCDD						
Total TCDD						
1,2,3,7,8-PeCDF						
2,3,4,7,8-PeCDF						
Total PeCDF						
1,2,3,7,8-PeCDD						
Total PeCDD						
1,2,3,4,7,8-HxCDF					UJ	
1,2,3,6,7,8-HxCDF						
2,3,4,6,7,8-HxCDF					U	
1,2,3,7,8,9-HxCDF					U	
Total HxCDF					U	
1,2,3,4,7,8-HxCDD						
1,2,3,6,7,8-HxCDD						
1,2,3,7,8,9-HxCDD						
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	UJ				UJ	J
1,2,3,4,7,8,9-HpCDF						
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	U				UJ	U
Total HpCDD	U					J
OCDF					UJ	UJ
OCDD	UJ	U	UJ	U	U	U



## 6. REFERENCES

*Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA 540/R-99/008, October 1999, U.S. Environmental Protection Agency, Cincinnati, Ohio.

USEPA Analytical Operations / Data Quality Center, *National Functional Guidelines for Chlorinated Dioxin / Furan Data Review*, EPA 540-R-02-003, August 2002.

USEPA, *Methods for the Analysis of Wastes, High Resolution Gas Chromatography / Mass Spectrometry*, SW-846, July 2002.

USEPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Doc. No. SW-846, 3<sup>rd</sup> Ed., Method 8290, Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS), Revision 0, September 1994.

## 9. ATTACHMENTS

The following items are included as an attachment to this L&V report:

- A. Qualified reported results (Form I)

## **Attachment A**

### **Qualified Reported Results**





Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-200-A		
Lab Sample ID	1060842001		
Filename	F71102B_07		
Injected By	BAL		
Total Amount Extracted	953 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 21:16

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.60	2,3,7,8-TCDF-13C	2.00	69
Total TCDF	ND	—	1.60	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	ND	—	1.30	2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	ND	—	1.30	1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	85
1,2,3,7,8-PeCDF	ND	—	2.50	1,2,3,6,7,8-HxCDF-13C	2.00	93
2,3,4,7,8-PeCDF	ND	—	1.90	2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	2.20	1,2,3,7,8,9-HxCDF-13C	2.00	81
				1,2,3,4,7,8-HxCDD-13C	2.00	94
1,2,3,7,8-PeCDD	ND	—	2.00	1,2,3,6,7,8-HxCDD-13C	2.00	99
Total PeCDD	ND	—	2.00	1,2,3,4,6,7,8-HpCDF-13C	2.00	90
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	ND	—	0.77	1,2,3,4,6,7,8-HpCDD-13C	2.00	103
1,2,3,6,7,8-HxCDF	ND	—	0.96	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	—	0.88			
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.90	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.60	2,3,7,8-TCDD-37Cl4	0.20	65
1,2,3,6,7,8-HxCDD	ND	—	2.00			
1,2,3,7,8,9-HxCDD	ND	—	1.60			
Total HxCDD	ND	—	1.70			
1,2,3,4,6,7,8-HpCDF	ND	—	0.80	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.50	Equivalence: 0.0088 pg/L		
Total HpCDF	ND	—	1.10	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.1	1.00 + UJ			
Total HpCDD	ND	—	1.00			
OCDF	—	2.0	1.80 + UJ			
OCDD	8.8	—	2.60 - BJ U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Report No.....1060842



Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-200-B		
Lab Sample ID	1060842002		
Filename	F71102B_08		
Injected By	BAL		
Total Amount Extracted	978 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 22:02

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.93	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	ND	—	0.93	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	1.40	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	—	1.40	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	2.00	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	—	1.90	1,2,3,7,8,9-HxCDF-13C	2.00	68
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	—	2.30	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	2.30	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	ND	—	0.90	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	ND	—	0.83			
1,2,3,7,8,9-HxCDF	ND	—	1.10	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.97	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.10	2,3,7,8-TCDD-37Cl4	0.20	67
1,2,3,6,7,8-HxCDD	ND	—	1.60			
1,2,3,7,8,9-HxCDD	ND	—	1.30			
Total HxCDD	ND	—	1.30			
1,2,3,4,6,7,8-HpCDF	ND	—	0.83	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.90	Equivalence: 0.027 pg/L		
Total HpCDF	1.8	—	1.40 J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.7	—	1.60 J U			
Total HpCDD	6.0	—	1.60 J U			
OCDF	—	3.0	1.80 Y U S			
OCDD	—	27.0	2.90 + U S			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

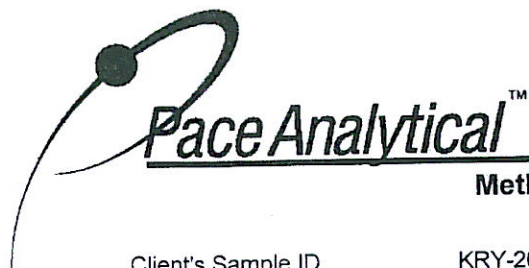
J = Value below calibration range  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Report No.....1060842





Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-200-C		
Lab Sample ID	1060842003		
Filename	F71102B_09		
Injected By	BAL		
Total Amount Extracted	954 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 22:48

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.70	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	—	0.70	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	ND	—	1.50	2,3,4,7,8-PeCDF-13C	2.00	77
Total TCDD	ND	—	1.50	1,2,3,7,8-PeCDD-13C	2.00	93
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	1.90	1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	ND	—	2.30	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	—	2.10	1,2,3,7,8,9-HxCDF-13C	2.00	71
				1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	—	2.50	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	2.50	1,2,3,4,6,7,8-HpCDF-13C	2.00	88
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	ND	—	0.74	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	—	0.91	OCDD-13C	4.00	66
2,3,4,6,7,8-HxCDF	ND	—	0.80			
1,2,3,7,8,9-HxCDF	ND	—	1.30	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.94	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.40	2,3,7,8-TCDD-37Cl4	0.20	62
1,2,3,6,7,8-HxCDD	ND	—	1.30			
1,2,3,7,8,9-HxCDD	ND	—	1.50			
Total HxCDD	ND	—	1.40			
1,2,3,4,6,7,8-HpCDF	ND	—	0.97	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.20	Equivalence: 0.00 pg/L		
Total HpCDF	ND	—	1.10	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.4	1.30 + u J			
Total HpCDD	ND	—	1.30			
OCDF	—	3.3	1.80 + u J			
OCDD	—	9.8	2.40 + u J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

I = Interference present

Y = Calculated using average of daily RFs

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-202-A		
Lab Sample ID	1060842004		
Filename	F71102B_10		
Injected By	BAL		
Total Amount Extracted	947 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 23:33

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.80	2,3,7,8-TCDF-13C	2.00	90
Total TCDF	ND	—	0.80	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	ND	—	1.20	2,3,4,7,8-PeCDF-13C	2.00	89
Total TCDD	ND	—	1.20	1,2,3,7,8-PeCDD-13C	2.00	106
				1,2,3,4,7,8-HxCDF-13C	2.00	95
1,2,3,7,8-PeCDF	ND	—	1.90	1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	ND	—	1.70	2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	1.80	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	90
1,2,3,7,8-PeCDD	ND	—	2.20	1,2,3,6,7,8-HxCDD-13C	2.00	103
Total PeCDD	ND	—	2.20	1,2,3,4,6,7,8-HpCDF-13C	2.00	97
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	104
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	4.00	73
2,3,4,6,7,8-HxCDF	ND	—	0.67			
1,2,3,7,8,9-HxCDF	ND	—	1.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.99	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.50	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	—	1.40			
1,2,3,7,8,9-HxCDD	ND	—	1.40			
Total HxCDD	ND	—	1.40			
1,2,3,4,6,7,8-HpCDF	ND	—	0.96	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.20	Equivalence: 0.011 pg/L		
Total HpCDF	ND	—	1.10	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	1.20			
Total HpCDD	ND	—	1.20			
OCDF	2.5	—	1.40	JY U		
OCDD	8.7	—	2.30	Bt U		

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-202-B		
Lab Sample ID	1060842005		
Filename	F71102B_11		
Injected By	BAL		
Total Amount Extracted	969 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 00:19

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.99	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	ND	—	0.99	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	93
2,3,7,8-TCDD	ND	—	1.20	2,3,4,7,8-PeCDF-13C	2.00	104
Total TCDD	ND	—	1.20	1,2,3,7,8-PeCDD-13C	2.00	114
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	—	2.30	1,2,3,6,7,8-HxCDF-13C	2.00	88
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	—	2.00	1,2,3,7,8,9-HxCDF-13C	2.00	79
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	ND	—	2.40	1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	—	2.40	1,2,3,4,6,7,8-HpCDF-13C	2.00	87
				1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	—	1.10	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	0.92	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.20	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	—	1.20			
1,2,3,7,8,9-HxCDD	ND	—	1.10			
Total HxCDD	ND	—	1.20			
1,2,3,4,6,7,8-HpCDF	ND	—	1.20	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.40	Equivalence: 0.019 pg/L		
Total HpCDF	ND	—	1.30	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.9	—	0.94 J			
Total HpCDD	1.9	—	0.94 J			
OCDF	ND	—	1.60			
OCDD	—	7.6	2.60 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Report No.....1060842



Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-202-C		
Lab Sample ID	1060842006		
Filename	F71102B_12		
Injected By	BAL		
Total Amount Extracted	977 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 01:05

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	---	0.84	2,3,7,8-TCDF-13C	2.00	70
Total TCDF	ND	---	0.84	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	---	1.40	2,3,4,7,8-PeCDF-13C	2.00	88
Total TCDD	ND	---	1.40	1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	---	2.30	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	---	2.00	2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF	ND	---	2.10	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	---	3.00	1,2,3,6,7,8-HxCDD-13C	2.00	98
Total PeCDD	ND	---	3.00	1,2,3,4,6,7,8-HpCDF-13C	2.00	86
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	ND	---	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	ND	---	1.10	OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	ND	---	1.00			
1,2,3,7,8,9-HxCDF	ND	---	1.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	---	1.10	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	---	1.40	2,3,7,8-TCDD-37Cl4	0.20	69
1,2,3,6,7,8-HxCDD	ND	---	1.40			
1,2,3,7,8,9-HxCDD	ND	---	1.40			
Total HxCDD	ND	---	1.40			
1,2,3,4,6,7,8-HpCDF	ND	---	0.99	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	---	1.70	Equivalence: 0.046 pg/L		
Total HpCDF	ND	---	1.40	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.3	---	1.20 J U			
Total HpCDD	7.0	---	1.20 J U			
OCDF	---	3.6	2.90 Y U			
OCDD	23.0	---	3.00 B U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
I = Interference present  
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Report No. ....1060842





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1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-203-A		
Lab Sample ID	1060842007		
Filename	F71102B_13		
Injected By	BAL		
Total Amount Extracted	958 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 01:51

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.30	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	ND	—	1.30	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	82
2,3,7,8-TCDD	ND	—	1.40	2,3,4,7,8-PeCDF-13C	2.00	95
Total TCDD	ND	—	1.40	1,2,3,7,8-PeCDD-13C	2.00	106
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	1.70	1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	—	1.80	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	—	2.70	1,2,3,6,7,8-HxCDD-13C	2.00	100
Total PeCDD	ND	—	2.70	1,2,3,4,6,7,8-HpCDF-13C	2.00	86
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64
1,2,3,4,7,8-HxCDF	ND	—	0.95	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	—	0.99	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	—	0.93			
1,2,3,7,8,9-HxCDF	ND	—	1.10	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.20	2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	ND	—	1.30			
1,2,3,7,8,9-HxCDD	ND	—	1.20			
Total HxCDD	ND	—	1.20			
1,2,3,4,6,7,8-HpCDF	—	1.2	0.99 + U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.50	Equivalence: 0.020 pg/L		
Total HpCDF	ND	—	1.30	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.0	—	1.40 + U			
Total HpCDD	3.6	—	1.40 + U			
OCDF	ND	—	2.70			
OCDD	—	8.8	2.80 + U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

J = Value below calibration range

I = Interference present

Y = Calculated using average of daily RFs

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

## REPORT OF LABORATORY ANALYSIS

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Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-203-B		
Lab Sample ID	1060842008		
Filename	F71102B_14		
Injected By	BAL		
Total Amount Extracted	948 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 02:36

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	---	1.7	2,3,7,8-TCDF-13C	2.00	71
Total TCDF	ND	---	1.7	2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	ND	---	1.5	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	---	1.5	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	---	1.6	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	ND	---	2.9	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	---	2.3	1,2,3,7,8,9-HxCDF-13C	2.00	70
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	---	3.0	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	---	3.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	90
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	---	1.8	1,2,3,4,6,7,8-HpCDD-13C	2.00	95
1,2,3,6,7,8-HxCDF	ND	---	1.5	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	---	1.5			
1,2,3,7,8,9-HxCDF	ND	---	1.9	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	---	1.7	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	---	1.8	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	---	1.5			
1,2,3,7,8,9-HxCDD	ND	---	1.5			
Total HxCDD	ND	---	1.6			
1,2,3,4,6,7,8-HpCDF	ND	---	1.3	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	---	2.3	Equivalence: 0.011 pg/L		
Total HpCDF	ND	---	1.8	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	---	1.5			
Total HpCDD	ND	---	1.5			
OCDF	ND	---	2.9			
OCDD	11	---	3.0			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-203-C		
Lab Sample ID	1060842009		
Filename	F71102B_15		
Injected By	BAL		
Total Amount Extracted	975 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 03:22

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.90	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	—	0.90	2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	1.70	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	—	1.70	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	2.40	1,2,3,6,7,8-HxCDF-13C	2.00	88
2,3,4,7,8-PeCDF	ND	—	2.40	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	—	2.40	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,7,8-PeCDD	ND	—	3.10	1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	—	3.10	1,2,3,4,6,7,8-HpCDF-13C	2.00	93
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	—	0.99	1,2,3,4,6,7,8-HpCDD-13C	2.00	107
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	4.00	72
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	1.50	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.10	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.50	2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	—	1.00			
1,2,3,7,8,9-HxCDD	ND	—	1.20			
Total HxCDD	ND	—	1.20			
1,2,3,4,6,7,8-HpCDF	ND	—	1.40	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	2.20	Equivalence: 0.00 pg/L		
Total HpCDF	ND	—	1.80	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	1.30			
Total HpCDD	ND	—	1.30			
OCDF	ND	—	2.50			
OCDD	—	5.0	3.70 + Y			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

I = Interference present  
Y = Calculated using average of daily RFs

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-204		
Lab Sample ID	1060842010		
Filename	F71102B_16		
Injected By	BAL		
Total Amount Extracted	939 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 04:08

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.2	2,3,7,8-TCDF-13C	2.00	69
Total TCDF	ND	—	1.2	2,3,7,8-TCDD-13C	2.00	67
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	1.7	2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	ND	—	1.7	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	—	2.6	1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	—	3.5	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	—	3.0	1,2,3,7,8,9-HxCDF-13C	2.00	70
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	—	2.8	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	2.8	1,2,3,4,6,7,8-HpCDF-13C	2.00	79
				1,2,3,4,7,8,9-HpCDF-13C	2.00	58
1,2,3,4,7,8-HxCDF	ND	—	1.5	1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	ND	—	1.4	OCDD-13C	4.00	55
2,3,4,6,7,8-HxCDF	ND	—	1.3			
1,2,3,7,8,9-HxCDF	ND	—	1.7	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.5	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	2.3	2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	ND	—	2.0			
1,2,3,7,8,9-HxCDD	ND	—	1.9			
Total HxCDD	ND	—	2.1			
1,2,3,4,6,7,8-HpCDF	ND	—	1.2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	2.9	Equivalence: 0.0060 pg/L		
Total HpCDF	ND	—	2.0	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	2.0			
Total HpCDD	ND	—	2.0			
OCDF	ND	—	4.0			
OCDD	6.0	—	3.3			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
Y = Calculated using average of daily RFs

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-205		
Lab Sample ID	1060842011		
Filename	F71103B_09		
Injected By	BAL		
Total Amount Extracted	980 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 19:41

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	---	1.20	2,3,7,8-TCDF-13C	2.00	51
Total TCDF	ND	---	1.20	2,3,7,8-TCDD-13C	2.00	52
				1,2,3,7,8-PeCDF-13C	2.00	53
2,3,7,8-TCDD	ND	---	1.60	2,3,4,7,8-PeCDF-13C	2.00	56
Total TCDD	ND	---	1.60	1,2,3,7,8-PeCDD-13C	2.00	69
				1,2,3,4,7,8-HxCDF-13C	2.00	54
1,2,3,7,8-PeCDF	ND	---	2.30	1,2,3,6,7,8-HxCDF-13C	2.00	59
2,3,4,7,8-PeCDF	ND	---	2.40	2,3,4,6,7,8-HxCDF-13C	2.00	57
Total PeCDF	ND	---	2.30	1,2,3,7,8,9-HxCDF-13C	2.00	46
				1,2,3,4,7,8-HxCDD-13C	2.00	62
1,2,3,7,8-PeCDD	ND	---	3.30	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	---	3.30	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	52
1,2,3,4,7,8-HxCDF	---	1.3	1.00 + UJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	---	1.00	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	1.4	---	0.78 B+ U			
1,2,3,7,8,9-HxCDF	1.5	---	1.10 B+ J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.9	---	0.98 B+ J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	---	2.00	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	---	1.80			
1,2,3,7,8,9-HxCDD	ND	---	2.00			
Total HxCDD	ND	---	1.90			
1,2,3,4,6,7,8-HpCDF	---	2.0	1.40 + UJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	---	1.70	Equivalence: 0.30 pg/L		
Total HpCDF	ND	---	1.50	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	---	2.3	1.30 + UJ			
Total HpCDD	ND	---	1.30			
OCDF	---	3.4	1.40 + UJ			
OCDD	17.0	---	3.50 B+ U			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit.

J = Value below calibration range

B = Less than 10x higher than method blank level

I = Interference present

Y = Calculated using average of daily RFs

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-206		
Lab Sample ID	1060842012		
Filename	F71103B_10		
Injected By	BAL		
Total Amount Extracted	958 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 20:27

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.88	2,3,7,8-TCDF-13C	2.00	63
Total TCDF	ND	—	0.88	2,3,7,8-TCDD-13C	2.00	64
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	—	0.70	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	ND	—	0.70	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	63
1,2,3,7,8-PeCDF	ND	—	1.80	1,2,3,6,7,8-HxCDF-13C	2.00	67
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	67
Total PeCDF	ND	—	1.80	1,2,3,7,8,9-HxCDF-13C	2.00	62
				1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	—	2.50	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	ND	—	2.50	1,2,3,4,6,7,8-HpCDF-13C	2.00	77
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	—	0.81	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	—	0.88	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	—	0.78			
1,2,3,7,8,9-HxCDF	ND	—	1.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.91	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.50	2,3,7,8-TCDD-37Cl4	0.20	61
1,2,3,6,7,8-HxCDD	ND	—	1.60			
1,2,3,7,8,9-HxCDD	ND	—	1.50			
Total HxCDD	ND	—	1.50			
1,2,3,4,6,7,8-HpCDF	—	0.73	0.53 + J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.82	Equivalence: 0.027 pg/L		
Total HpCDF	ND	—	0.67	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.6	—	1.20 J U			
Total HpCDD	3.6	—	1.20 J J			
OCDF	—	2.00	1.10 IY UJ			
OCDD	11.0	—	1.70 BJ U			

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RL = Reporting Limit.

ND = Not Detected  
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NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
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**Report Prepared for:**

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Helena MT 59620

**REPORT OF  
LABORATORY  
ANALYSIS FOR  
PCDD/PCDF**

**Report Prepared Date:**

November 5, 2007

**Report Information:**

**Pace Project #: 1060842**  
**Sample Receipt Date: 10/12/2007**  
**Client Project #: Kalispell Post & Timber**  
**Client Sub PO #: N/A**  
**State Cert #: N/A**

**Invoicing & Reporting Options:**

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

**This report has been reviewed and prepared by:**

Scott Unze, Project Manager  
(612) 607-6383  
(612) 607-6444 (fax)  
scott.unze@pacelabs.com



**Report of Laboratory Analysis**

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Pace Analytical Services, Inc.  
1700 Elm Street  
Minneapolis, MN 55414  
Phone: 612.607.1700  
Fax: 612.607.6444

## **DISCUSSION**

This report presents the results from the analyses performed on twelve samples submitted by a representative of the Montana DEQ. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290. Reporting limits were based on signal-to-noise measurements.

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 46-114%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

In some cases, interfering substances impacted the determinations of PCDD or PCDF congeners. The affected values were flagged "I" where incorrect isotope ratios were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to contain trace levels of selected congeners. These were below the calibration range of the method. Sample levels similar to the corresponding blank levels were flagged "B" on the results tables and may be, at least partially, attributed to the background. It should be noted that levels less than ten times the background are not generally considered to be statistically different from the background.

Laboratory spike samples were also prepared with the sample batch using clean water that had been fortified with native standard materials. The results show that the spiked native compounds were recovered at 82-116%, with relative percent differences of 0.0-11.0%. These results indicate high degrees of accuracy and precision for these determinations.

The response obtained for the native OCDF in calibration standard analysis F71102B\_18 was outside the target range. As specified in the method, the average of the daily response factors for this compound was used in the calculations for the samples from this runshift. The affected values were flagged "Y" on the results tables.

## **REPORT OF LABORATORY ANALYSIS**

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## **Appendix A**

### Sample Management



F-ALL-Q-020rev.07, 15-May-2007





# Sample Condition Upon Receipt

Client Name: Pioneer Tech Services Project # 1060842

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: 1Z A85 34E 01 9282 5370

Custody Seal on Cooler/Box Present: ☒ Yes ☐ no Seals intact: ☒ yes ☐ no

Optional:
Proj Due Date:
Proj Name:

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_

Thermometer Used 230194010

Type of Ice: Wet Blue None

☐ Samples on ice, cooling process has begun

Cooler Temperature 1.8, 3.1, 3.0, 3.8

Biological Tissue is Frozen: Yes No

Date and initials of person examining contents: 10-12-07 JK

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10. <u>Sample KRY-200-C HAD 1 GL Received Broken</u>
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>WT</u>		
All containers needing preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required?

Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_

Date: 10/12/07

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



## **Appendix B**

### Sample Analysis Summary



**Pace Analytical™**

Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-200-A		
Lab Sample ID	1060842001		
Filename	F71102B_07		
Injected By	BAL		
Total Amount Extracted	953 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 21:16

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.60	2,3,7,8-TCDF-13C	2.00	69
Total TCDF	ND	—	1.60	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	ND	—	1.30	2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	ND	—	1.30	1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	85
1,2,3,7,8-PeCDF	ND	—	2.50	1,2,3,6,7,8-HxCDF-13C	2.00	93
2,3,4,7,8-PeCDF	ND	—	1.90	2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	2.20	1,2,3,7,8,9-HxCDF-13C	2.00	81
				1,2,3,4,7,8-HxCDD-13C	2.00	94
1,2,3,7,8-PeCDD	ND	—	2.00	1,2,3,6,7,8-HxCDD-13C	2.00	99
Total PeCDD	ND	—	2.00	1,2,3,4,6,7,8-HpCDF-13C	2.00	90
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	ND	—	0.77	1,2,3,4,6,7,8-HpCDD-13C	2.00	103
1,2,3,6,7,8-HxCDF	ND	—	0.96	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	—	0.88			
1,2,3,7,8,9-HxCDF	ND	—	1.00	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.90	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.60	2,3,7,8-TCDD-37Cl4	0.20	65
1,2,3,6,7,8-HxCDD	ND	—	2.00			
1,2,3,7,8,9-HxCDD	ND	—	1.60			
Total HxCDD	ND	—	1.70			
1,2,3,4,6,7,8-HpCDF	ND	—	0.80	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.50	Equivalence: 0.0088 pg/L		
Total HpCDF	ND	—	1.10	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.1	1.00 I			
Total HpCDD	ND	—	1.00			
OCDF	—	2.0	1.80 IY			
OCDD	8.8	—	2.60 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-200-B		
Lab Sample ID	1060842002		
Filename	F71102B_08		
Injected By	BAL		
Total Amount Extracted	978 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 22:02

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.93	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	ND	—	0.93	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	1.40	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	—	1.40	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	2.00	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	—	1.90	1,2,3,7,8,9-HxCDF-13C	2.00	68
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	—	2.30	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	2.30	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	ND	—	0.90	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	ND	—	0.83			
1,2,3,7,8,9-HxCDF	ND	—	1.10	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.97	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.10	2,3,7,8-TCDD-37Cl4	0.20	67
1,2,3,6,7,8-HxCDD	ND	—	1.60			
1,2,3,7,8,9-HxCDD	ND	—	1.30			
Total HxCDD	ND	—	1.30			
1,2,3,4,6,7,8-HpCDF	ND	—	0.83	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.90	Equivalence: 0.027 pg/L		
Total HpCDF	1.8	—	1.40 J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.7	—	1.60 J			
Total HpCDD	6.0	—	1.60 J			
OCDF	—	3.0	1.80 IY			
OCDD	—	27.0	2.90 I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-200-C		
Lab Sample ID	1060842003		
Filename	F71102B_09		
Injected By	BAL		
Total Amount Extracted	954 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 22:48

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.70	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	—	0.70	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	ND	—	1.50	2,3,4,7,8-PeCDF-13C	2.00	77
Total TCDD	ND	—	1.50	1,2,3,7,8-PeCDD-13C	2.00	93
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	1.90	1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	ND	—	2.30	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	—	2.10	1,2,3,7,8,9-HxCDF-13C	2.00	71
				1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	—	2.50	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	2.50	1,2,3,4,6,7,8-HpCDF-13C	2.00	88
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	ND	—	0.74	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	—	0.91	OCDD-13C	4.00	66
2,3,4,6,7,8-HxCDF	ND	—	0.80			
1,2,3,7,8,9-HxCDF	ND	—	1.30	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.94	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.40	2,3,7,8-TCDD-37Cl4	0.20	62
1,2,3,6,7,8-HxCDD	ND	—	1.30			
1,2,3,7,8,9-HxCDD	ND	—	1.50			
Total HxCDD	ND	—	1.40			
1,2,3,4,6,7,8-HpCDF	ND	—	0.97	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.20	Equivalence: 0.00 pg/L		
Total HpCDF	ND	—	1.10	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	1.4	1.30 I			
Total HpCDD	ND	—	1.30			
OCDF	—	3.3	1.80 IY			
OCDD	—	9.8	2.40 I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-202-A		
Lab Sample ID	1060842004		
Filename	F71102B_10		
Injected By	BAL		
Total Amount Extracted	947 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/02/2007 23:33

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.80	2,3,7,8-TCDF-13C	2.00	90
Total TCDF	ND	—	0.80	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	ND	—	1.20	2,3,4,7,8-PeCDF-13C	2.00	89
Total TCDD	ND	—	1.20	1,2,3,7,8-PeCDD-13C	2.00	106
				1,2,3,4,7,8-HxCDF-13C	2.00	95
1,2,3,7,8-PeCDF	ND	—	1.90	1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	ND	—	1.70	2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	1.80	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	90
1,2,3,7,8-PeCDD	ND	—	2.20	1,2,3,6,7,8-HxCDD-13C	2.00	103
Total PeCDD	ND	—	2.20	1,2,3,4,6,7,8-HpCDF-13C	2.00	97
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	104
1,2,3,6,7,8-HxCDF	ND	—	0.98	OCDD-13C	4.00	73
2,3,4,6,7,8-HxCDF	ND	—	0.67			
1,2,3,7,8,9-HxCDF	ND	—	1.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.99	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.50	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	—	1.40			
1,2,3,7,8,9-HxCDD	ND	—	1.40			
Total HxCDD	ND	—	1.40			
1,2,3,4,6,7,8-HpCDF	ND	—	0.96	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.20	Equivalence: 0.011 pg/L		
Total HpCDF	ND	—	1.10	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	1.20			
Total HpCDD	ND	—	1.20			
OCDF	2.5	—	1.40 JY			
OCDD	8.7	—	2.30 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-202-B		
Lab Sample ID	1060842005		
Filename	F71102B_11		
Injected By	BAL		
Total Amount Extracted	969 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 00:19

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.99	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	ND	—	0.99	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	93
2,3,7,8-TCDD	ND	—	1.20	2,3,4,7,8-PeCDF-13C	2.00	104
Total TCDD	ND	—	1.20	1,2,3,7,8-PeCDD-13C	2.00	114
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	—	2.30	1,2,3,6,7,8-HxCDF-13C	2.00	88
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	—	2.00	1,2,3,7,8,9-HxCDF-13C	2.00	79
				1,2,3,4,7,8-HxCDD-13C	2.00	91
1,2,3,7,8-PeCDD	ND	—	2.40	1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	—	2.40	1,2,3,4,6,7,8-HpCDF-13C	2.00	87
				1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	—	1.10	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	0.92	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.20	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	—	1.20			
1,2,3,7,8,9-HxCDD	ND	—	1.10			
Total HxCDD	ND	—	1.20			
1,2,3,4,6,7,8-HpCDF	ND	—	1.20	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.40	Equivalence: 0.019 pg/L		
Total HpCDF	ND	—	1.30	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.9	—	0.94 J			
Total HpCDD	1.9	—	0.94 J			
OCDF	ND	—	1.60			
OCDD	—	7.6	2.60 I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-202-C		
Lab Sample ID	1060842006		
Filename	F71102B_12		
Injected By	BAL		
Total Amount Extracted	977 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 01:05

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.84	2,3,7,8-TCDF-13C	2.00	70
Total TCDF	ND	—	0.84	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	—	1.40	2,3,4,7,8-PeCDF-13C	2.00	88
Total TCDD	ND	—	1.40	1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	—	2.30	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	—	2.00	2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF	ND	—	2.10	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	—	3.00	1,2,3,6,7,8-HxCDD-13C	2.00	98
Total PeCDD	ND	—	3.00	1,2,3,4,6,7,8-HpCDF-13C	2.00	86
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	ND	—	1.10	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	ND	—	1.10	OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	ND	—	1.00			
1,2,3,7,8,9-HxCDF	ND	—	1.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.10	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.40	2,3,7,8-TCDD-37Cl4	0.20	69
1,2,3,6,7,8-HxCDD	ND	—	1.40			
1,2,3,7,8,9-HxCDD	ND	—	1.40			
Total HxCDD	ND	—	1.40			
1,2,3,4,6,7,8-HpCDF	ND	—	0.99	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.70	Equivalence: 0.046 pg/L		
Total HpCDF	ND	—	1.40	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.3	—	1.20 J			
Total HpCDD	7.0	—	1.20 J			
OCDF	—	3.6	2.90 IY			
OCDD	23.0	—	3.00 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-203-A		
Lab Sample ID	1060842007		
Filename	F71102B_13		
Injected By	BAL		
Total Amount Extracted	958 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 01:51

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.30	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	ND	—	1.30	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	82
2,3,7,8-TCDD	ND	—	1.40	2,3,4,7,8-PeCDF-13C	2.00	95
Total TCDD	ND	—	1.40	1,2,3,7,8-PeCDD-13C	2.00	106
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	—	1.70	1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	—	1.80	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	—	2.70	1,2,3,6,7,8-HxCDD-13C	2.00	100
Total PeCDD	ND	—	2.70	1,2,3,4,6,7,8-HpCDF-13C	2.00	86
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64
1,2,3,4,7,8-HxCDF	ND	—	0.95	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	—	0.99	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	—	0.93			
1,2,3,7,8,9-HxCDF	ND	—	1.10	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.20	2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	ND	—	1.30			
1,2,3,7,8,9-HxCDD	ND	—	1.20			
Total HxCDD	ND	—	1.20			
1,2,3,4,6,7,8-HpCDF	—	1.2	0.99 I	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.50	Equivalence: 0.020 pg/L		
Total HpCDF	ND	—	1.30	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	2.0	—	1.40 J			
Total HpCDD	3.6	—	1.40 J			
OCDF	ND	—	2.70			
OCDD	—	8.8	2.80 I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-203-B		
Lab Sample ID	1060842008		
Filename	F71102B_14		
Injected By	BAL		
Total Amount Extracted	948 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 02:36

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.7	2,3,7,8-TCDF-13C	2.00	71
Total TCDF	ND	—	1.7	2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	ND	—	1.5	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	—	1.5	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	—	1.6	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	ND	—	2.9	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	—	2.3	1,2,3,7,8,9-HxCDF-13C	2.00	70
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	—	3.0	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	3.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	90
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	—	1.8	1,2,3,4,6,7,8-HpCDD-13C	2.00	95
1,2,3,6,7,8-HxCDF	ND	—	1.5	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	—	1.5			
1,2,3,7,8,9-HxCDF	ND	—	1.9	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.7	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.8	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	—	1.5			
1,2,3,7,8,9-HxCDD	ND	—	1.5			
Total HxCDD	ND	—	1.6			
1,2,3,4,6,7,8-HpCDF	ND	—	1.3	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	2.3	Equivalence: 0.011 pg/L		
Total HpCDF	ND	—	1.8	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	1.5			
Total HpCDD	ND	—	1.5			
OCDF	ND	—	2.9			
OCDD	11	—	3.0 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-203-C		
Lab Sample ID	1060842009		
Filename	F71102B_15		
Injected By	BAL		
Total Amount Extracted	975 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 03:22

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.90	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	—	0.90	2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	1.70	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	—	1.70	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	—	2.40	1,2,3,6,7,8-HxCDF-13C	2.00	88
2,3,4,7,8-PeCDF	ND	—	2.40	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	—	2.40	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,7,8-PeCDD	ND	—	3.10	1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	—	3.10	1,2,3,4,6,7,8-HpCDF-13C	2.00	93
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	—	0.99	1,2,3,4,6,7,8-HpCDD-13C	2.00	107
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	4.00	72
2,3,4,6,7,8-HxCDF	ND	—	0.99			
1,2,3,7,8,9-HxCDF	ND	—	1.50	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.10	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.50	2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	—	1.00			
1,2,3,7,8,9-HxCDD	ND	—	1.20			
Total HxCDD	ND	—	1.20			
1,2,3,4,6,7,8-HpCDF	ND	—	1.40	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	2.20	Equivalence: 0.00 pg/L		
Total HpCDF	ND	—	1.80	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	1.30			
Total HpCDD	ND	—	1.30			
OCDF	ND	—	2.50			
OCDD	—	5.0	3.70 I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-204		
Lab Sample ID	1060842010		
Filename	F71102B_16		
Injected By	BAL		
Total Amount Extracted	939 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 04:08

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.2	2,3,7,8-TCDF-13C	2.00	69
Total TCDF	ND	—	1.2	2,3,7,8-TCDD-13C	2.00	67
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	—	1.7	2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	ND	—	1.7	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	—	2.6	1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	—	3.5	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	—	3.0	1,2,3,7,8,9-HxCDF-13C	2.00	70
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	—	2.8	1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	—	2.8	1,2,3,4,6,7,8-HpCDF-13C	2.00	79
				1,2,3,4,7,8,9-HpCDF-13C	2.00	58
1,2,3,4,7,8-HxCDF	ND	—	1.5	1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	ND	—	1.4	OCDD-13C	4.00	55
2,3,4,6,7,8-HxCDF	ND	—	1.3			
1,2,3,7,8,9-HxCDF	ND	—	1.7	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	1.5	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	2.3	2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	ND	—	2.0			
1,2,3,7,8,9-HxCDD	ND	—	1.9			
Total HxCDD	ND	—	2.1			
1,2,3,4,6,7,8-HpCDF	ND	—	1.2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	2.9	Equivalence: 0.0060 pg/L		
Total HpCDF	ND	—	2.0	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	—	2.0			
Total HpCDD	ND	—	2.0			
OCDF	ND	—	4.0			
OCDD	6.0	—	3.3 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
Y = Calculated using average of daily RFs

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-205		
Lab Sample ID	1060842011		
Filename	F71103B_09		
Injected By	BAL		
Total Amount Extracted	980 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 19:41

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	1.20	2,3,7,8-TCDF-13C	2.00	51
Total TCDF	ND	—	1.20	2,3,7,8-TCDD-13C	2.00	52
				1,2,3,7,8-PeCDF-13C	2.00	53
2,3,7,8-TCDD	ND	—	1.60	2,3,4,7,8-PeCDF-13C	2.00	56
Total TCDD	ND	—	1.60	1,2,3,7,8-PeCDD-13C	2.00	69
				1,2,3,4,7,8-HxCDF-13C	2.00	54
1,2,3,7,8-PeCDF	ND	—	2.30	1,2,3,6,7,8-HxCDF-13C	2.00	59
2,3,4,7,8-PeCDF	ND	—	2.40	2,3,4,6,7,8-HxCDF-13C	2.00	57
Total PeCDF	ND	—	2.30	1,2,3,7,8,9-HxCDF-13C	2.00	46
				1,2,3,4,7,8-HxCDD-13C	2.00	62
1,2,3,7,8-PeCDD	ND	—	3.30	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	—	3.30	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	52
1,2,3,4,7,8-HxCDF	—	1.3	1.00 I	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	—	1.00	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	1.4	—	0.78 BJ			
1,2,3,7,8,9-HxCDF	1.5	—	1.10 BJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.9	—	0.98 BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	2.00	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	—	1.80			
1,2,3,7,8,9-HxCDD	ND	—	2.00			
Total HxCDD	ND	—	1.90			
1,2,3,4,6,7,8-HpCDF	—	2.0	1.40 I	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	1.70	Equivalence: 0.30 pg/L		
Total HpCDF	ND	—	1.50	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	2.3	1.30 I			
Total HpCDD	ND	—	1.30			
OCDF	—	3.4	1.40 IY			
OCDD	17.0	—	3.50 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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## Method 8290 Sample Analysis Results

Client - Montana Dept. Of Env. Quality

Client's Sample ID	KRY-206		
Lab Sample ID	1060842012		
Filename	F71103B_10		
Injected By	BAL		
Total Amount Extracted	958 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/10/2007
ICAL Date	08/30/2007	Received	10/12/2007
CCal Filename(s)	F71102B_01 & F71102B_18	Extracted	10/31/2007
Method Blank ID	BLANK-14617	Analyzed	11/03/2007 20:27

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.88	2,3,7,8-TCDF-13C	2.00	63
Total TCDF	ND	—	0.88	2,3,7,8-TCDD-13C	2.00	64
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	—	0.70	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	ND	—	0.70	1,2,3,7,8-PeCDD-13C	2.00	86
				1,2,3,4,7,8-HxCDF-13C	2.00	63
1,2,3,7,8-PeCDF	ND	—	1.80	1,2,3,6,7,8-HxCDF-13C	2.00	67
2,3,4,7,8-PeCDF	ND	—	1.80	2,3,4,6,7,8-HxCDF-13C	2.00	67
Total PeCDF	ND	—	1.80	1,2,3,7,8,9-HxCDF-13C	2.00	62
				1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	—	2.50	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	ND	—	2.50	1,2,3,4,6,7,8-HpCDF-13C	2.00	77
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	—	0.81	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	—	0.88	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	—	0.78			
1,2,3,7,8,9-HxCDF	ND	—	1.20	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	0.91	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.50	2,3,7,8-TCDD-37Cl4	0.20	61
1,2,3,6,7,8-HxCDD	ND	—	1.60			
1,2,3,7,8,9-HxCDD	ND	—	1.50			
Total HxCDD	ND	—	1.50			
1,2,3,4,6,7,8-HpCDF	—	0.73	0.53 I	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	0.82	Equivalence: 0.027 pg/L		
Total HpCDF	ND	—	0.67	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	1.6	—	1.20 J			
Total HpCDD	3.6	—	1.20 J			
OCDF	—	2.00	1.10 IY			
OCDD	11.0	—	1.70 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit.

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

J = Value below calibration range  
B = Less than 10x higher than method blank level  
I = Interference present  
Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-14617	Matrix	Water
Filename	F71102B_06	Dilution	NA
Total Amount Extracted	934 mL	Extracted	10/31/2007
ICAL Date	08/30/2007	Analyzed	11/02/2007 20:31
CCal Filename(s)	F71102B_01 & F71102B_18	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	0.79	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	—	0.79	2,3,7,8-TCDD-13C	2.00	75
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	ND	—	0.97	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	—	0.97	1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	86
1,2,3,7,8-PeCDF	ND	—	1.60	1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	ND	—	1.60	2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	—	1.60	1,2,3,7,8,9-HxCDF-13C	2.00	80
				1,2,3,4,7,8-HxCDD-13C	2.00	90
1,2,3,7,8-PeCDD	ND	—	2.50	1,2,3,6,7,8-HxCDD-13C	2.00	102
Total PeCDD	ND	—	2.50	1,2,3,4,6,7,8-HpCDF-13C	2.00	89
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	—	1.9	0.69 I	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	—	1.5	0.71 I	OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	1.40	—	0.55 J			
1,2,3,7,8,9-HxCDF	0.96	—	0.72 J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.40	—	0.67 J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	—	1.2	1.10 I	2,3,7,8-TCDD-37Cl4	0.20	67
1,2,3,6,7,8-HxCDD	ND	—	1.40			
1,2,3,7,8,9-HxCDD	ND	—	1.40			
Total HxCDD	ND	—	1.30			
1,2,3,4,6,7,8-HpCDF	ND	—	1.30	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	—	2.50	Equivalence: 0.25 pg/L		
Total HpCDF	ND	—	1.90	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	—	3.7	1.60 I			
Total HpCDD	ND	—	1.60			
OCDF	—	4.0	2.30 IY			
OCDD	15.00	—	2.00 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

J = Value below calibration range

I = Interference present

Y = Calculated using average of daily RFs

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-14618	Matrix	Water
Filename	F71102B_03	Dilution	NA
Total Amount Extracted	953 mL	Extracted	10/31/2007
ICAL Date	08/30/2007	Analyzed	11/02/2007 18:15
CCal Filename(s)	F71102B_01 & F71102B_18	Injected By	BAL
Method Blank ID	BLANK-14617		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.19	96	2,3,7,8-TCDF-13C	2.00	73
Total TCDF				2,3,7,8-TCDD-13C	2.00	70
				1,2,3,7,8-PeCDF-13C	2.00	71
2,3,7,8-TCDD	0.20	0.18	92	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD				1,2,3,7,8-PeCDD-13C	2.00	99
				1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	1.00	1.02	102	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	1.00	0.93	93	2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.00	71
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	1.00	0.89	89	1,2,3,6,7,8-HxCDD-13C	2.00	90
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.00	80
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	1.00	0.89	89	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	1.00	0.99	99	OCDD-13C	4.00	59
2,3,4,6,7,8-HxCDF	1.00	0.97	97			
1,2,3,7,8,9-HxCDF	1.00	0.94	94	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	0.97	97	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	1.00	0.93	93			
1,2,3,7,8,9-HxCDD	1.00	0.93	93			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.00	0.97	97			
1,2,3,4,7,8,9-HpCDF	1.00	1.06	106			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.00	0.86	86			
Total HpCDD						
OCDF	2.00	2.32	116 Y			
OCDD	2.00	2.01	100			

Qs = Quantity Spiked  
Qm = Quantity Measured  
Rec. = Recovery (Expressed as Percent)  
P = Recovery outside of target range  
X = Background subtracted value  
Nn = Value obtained from additional analysis  
NA = Not Applicable  
\* = See Discussion

## REPORT OF LABORATORY ANALYSIS

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Report No.....1060842



Pace Analytical Services, Inc.  
1700 Elm Street - Suite 200  
Minneapolis, MN 55414

Tel: 612-607-1700  
Fax: 612-607-6444

## Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCSD-14619	Matrix	Water
Filename	F71102B_04	Dilution	NA
Total Amount Extracted	945 mL	Extracted	10/31/2007
ICAL Date	08/30/2007	Analyzed	11/02/2007 18:59
CCal Filename(s)	F71102B_01 & F71102B_18	Injected By	BAL
Method Blank ID	BLANK-14617		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.17	86	2,3,7,8-TCDF-13C	2.00	89
Total TCDF				2,3,7,8-TCDD-13C	2.00	87
				1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	0.20	0.18	89	2,3,4,7,8-PeCDF-13C	2.00	105
Total TCDD				1,2,3,7,8-PeCDD-13C	2.00	116
				1,2,3,4,7,8-HxCDF-13C	2.00	101
1,2,3,7,8-PeCDF	1.00	0.93	93	1,2,3,6,7,8-HxCDF-13C	2.00	101
2,3,4,7,8-PeCDF	1.00	0.88	88	2,3,4,6,7,8-HxCDF-13C	2.00	100
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.00	90
				1,2,3,4,7,8-HxCDD-13C	2.00	102
1,2,3,7,8-PeCDD	1.00	0.85	85	1,2,3,6,7,8-HxCDD-13C	2.00	112
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.00	103
				1,2,3,4,7,8,9-HpCDF-13C	2.00	81
1,2,3,4,7,8-HxCDF	1.00	0.87	87	1,2,3,4,6,7,8-HpCDD-13C	2.00	114
1,2,3,6,7,8-HxCDF	1.00	0.94	94	OCDD-13C	4.00	76
2,3,4,6,7,8-HxCDF	1.00	0.91	91			
1,2,3,7,8,9-HxCDF	1.00	0.88	88	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	0.87	87	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	1.00	0.93	93			
1,2,3,7,8,9-HxCDD	1.00	0.86	86			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.00	0.91	91			
1,2,3,4,7,8,9-HpCDF	1.00	0.99	99			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.00	0.82	82			
Total HpCDD						
OCDF	2.00	2.25	112 Y			
OCDD	2.00	1.92	96			

Qs = Quantity Spiked  
Qm = Quantity Measured  
Rec. = Recovery (Expressed as Percent)  
P = Recovery outside of target range  
X = Background subtracted value  
Nn = Value obtained from additional analysis  
NA = Not Applicable  
\* = See Discussion

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## Method 8290

### Spike Recovery Relative Percent Difference (RPD) Results

Client Montana Dept. Of Env. Quality

Spike 1 ID LCS-14618 Spike 2 ID LCSD-14619  
Spike 1 Filename F71102B\_03 Spike 2 Filename F71102B\_04

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDF	96	86	11.0
2,3,7,8-TCDD	92	89	3.3
1,2,3,7,8-PeCDF	102	93	9.2
2,3,4,7,8-PeCDF	93	88	5.5
1,2,3,7,8-PeCDD	89	85	4.6
1,2,3,4,7,8-HxCDF	89	87	2.3
1,2,3,6,7,8-HxCDF	99	94	5.2
2,3,4,6,7,8-HxCDF	97	91	6.4
1,2,3,7,8,9-HxCDF	94	88	6.6
1,2,3,4,7,8-HxCDD	97	87	10.9
1,2,3,6,7,8-HxCDD	93	93	0.0
1,2,3,7,8,9-HxCDD	93	86	7.8
1,2,3,4,6,7,8-HpCDF	97	91	6.4
1,2,3,4,7,8,9-HpCDF	106	99	6.8
1,2,3,4,6,7,8-HpCDD	86	82	4.8
OCDF	116	112	3.5
OCDD	100	96	4.1

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

## REPORT OF LABORATORY ANALYSIS

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**\*\* REPORT \*\***

Pioneer Technical Services  
Julie Flammang  
63 1/2 W. Broadway  
Butte MT 59701

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## ANALYTICAL SUMMARY REPORT

October 18, 2007

MT DEQ  
PO Box 200901  
Helena, MT 59620

Workorder No.: H07100177

Project Name: Kalispell Pole and Timber Reliance and Yale OilKRY

Energy Laboratories Inc received the following 10 samples from MT DEQ on 10/12/2007 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H07100177-001	KRY-200-A	10/10/07 16:00	10/12/07	Aqueous	Solids, Total Suspended
H07100177-002	KRY-200-B	10/10/07 16:10	10/12/07	Aqueous	Same As Above
H07100177-003	KRY-200-C	10/10/07 16:20	10/12/07	Aqueous	Same As Above
H07100177-004	KRY-202-A	10/10/07 13:25	10/12/07	Aqueous	Same As Above
H07100177-005	KRY-202-B	10/10/07 13:45	10/12/07	Aqueous	Same As Above
H07100177-006	KRY-202-C	10/10/07 13:35	10/12/07	Aqueous	Same As Above
H07100177-007	KRY-203-A	10/10/07 9:50	10/12/07	Aqueous	Same As Above
H07100177-008	KRY-203-B	10/10/07 10:00	10/12/07	Aqueous	Same As Above
H07100177-009	KRY-203-C	10/10/07 10:10	10/12/07	Aqueous	Same As Above
H07100177-010	KRY-205	10/10/07 17:00	10/12/07	Aqueous	Same As Above

### BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT, EPA # MT00005  
eli-c - Energy Laboratories, Inc. - Casper, WY, EPA# WY00002  
eli-f - Energy Laboratories, Inc. - Idaho Falls, ID, EPA # ID00942  
eli-g - Energy Laboratories, Inc. - Gillette, WY, EPA# WY00006  
eli-h - Energy Laboratories, Inc. - Helena, MT, EPA# MT00945  
eli-r - Energy Laboratories, Inc. - Rapid City, SD, EPA# SD00012  
eli-t - Energy Laboratories, Inc. - College Station, TX, EPA# TX01520

### SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES, INC. will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories are indicated within the Laboratory Analytical Report.

### SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

ELI appreciates the opportunity to provide you with this analytical service. For additional information, including certifications, and analytical services visit our web page [www.energylab.com](http://www.energylab.com).

Report Approved By: \_\_\_\_\_

Jonathan Hager



ENERGY LABORATORIES, INC. • P.O. Box 5688 • 3161 East Lyndale Ave. • Helena, MT 59604  
877-472-0711 • 406-442-0711 • 406-442-0712 fax • [helena@energylab.com](mailto:helena@energylab.com)

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Assistant Lab Manager





Date: 18-Oct-07

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CLIENT: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale Oil  
Sample Delivery Group: H07100177

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## CASE NARRATIVE

Level 4 QC not needed for work order.

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## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-001  
Client Sample ID: KRY-200-A

Report Date: 10/18/07  
Collection Date: 10/10/07 16:00  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:14 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-002  
Client Sample ID: KRY-200-B

Report Date: 10/18/07  
Collection Date: 10/10/07 16:10  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:14 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-003  
Client Sample ID: KRY-200-C

Report Date: 10/18/07  
Collection Date: 10/10/07 16:20  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:15 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-004  
Client Sample ID: KRY-202-A

Report Date: 10/18/07  
Collection Date: 10/10/07 13:25  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:15 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-005  
Client Sample ID: KRY-202-B

Report Date: 10/18/07  
Collection Date: 10/10/07 13:45  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:16 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-006  
Client Sample ID: KRY-202-C

Report Date: 10/18/07  
Collection Date: 10/10/07 13:35  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:16 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-007  
Client Sample ID: KRY-203-A

Report Date: 10/18/07  
Collection Date: 10/10/07 09:50  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:16 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-008  
Client Sample ID: KRY-203-B

Report Date: 10/18/07  
Collection Date: 10/10/07 10:00  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:17 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.





## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-009  
Client Sample ID: KRY-203-C

Report Date: 10/18/07  
Collection Date: 10/10/07 10:10  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:17 / sld

Report  
Definitions: RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Client: MT DEQ  
Project: Kalispell Pole and Timber Reliance and Yale OilKRY  
Lab ID: H07100177-010  
Client Sample ID: KRY-205

Report Date: 10/18/07  
Collection Date: 10/10/07 17:00  
Date Received: 10/12/07  
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
Solids, Total Suspended TSS @ 105 C	ND	mg/L		10		A2540 D	10/15/07 15:17 / sld

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## QA/QC Summary Report

Client: MT DEQ

Project: Kalispell Pole and Timber Reliance and Yale OilKRY

Report Date: 10/18/07

Work Order: H07100177

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 D							Batch: 071015A-SLDS-TSS-W		
Sample ID: LCS1_071015A	Laboratory Control Sample				Run: SOLIDS_071015A				10/15/07 15:14
Solids, Total Suspended TSS @ 105 C	1960	mg/L	10	98	70	130			
Sample ID: H07100177-010ADUP	Sample Duplicate				Run: SOLIDS_071015A				10/15/07 15:17
Solids, Total Suspended TSS @ 105 C	4.00	mg/L	10				0.0	10	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.





# Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side.

Company Name: <b>Pioneer Technical Services</b>		Project Name, PWS #, Permit #, Etc.: <b>Kalspell Pole &amp; Timber Port, Reliance &amp; Lake Oil (KRR)</b>	
Report Mail Address: <b>6312 W. Broadway Belle, MD 21714</b>		Sampler Name if other than Contact: <b>jflamman@bellsouth.com</b>	
Invoice Address: <b>Montana Department of Env. Quality Remediation Division PO Box 200701 Helena, MT 59620-0701</b>		Purchase Order #: <b>Bottle order # 2329</b>	
Report Required For: <input type="checkbox"/> POTW/WWTP <input type="checkbox"/> DW <input type="checkbox"/> Other _____		ELI Quote #:	
Special Report Formats - ELI must be notified prior to sample submittal for the following: NELAC <input type="checkbox"/> A2LA <input type="checkbox"/> Level IV <input checked="" type="checkbox"/> Other _____		Notify ELI prior to RUSH sample submittal for additional charges and scheduling Comments:	
EDD/EDT <input checked="" type="checkbox"/> Format _____		Receipt Temp _____ °C Cooler ID(s) _____	
Custody Seal <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N Intact <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N Signature Match <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N		Lab ID	
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Normal Turnaround (TAT)	
Collection Date		RUSH Turnaround (TAT)	
Collection Time		Comments:	
MATRIX		SEE ATTACHED	
Sample Type: A W S V B O Biossay Other		Number of Containers	
1 KRR-200-A		1 W	
2 KRR-200-B		1 W	
3 KRR-200-C		1 W	
4 KRR-200-A		1 W	
5 KRR-200-B		1 W	
6 KRR-200-C		1 W	
7 KRR-200-A		1 W	
8 KRR-200-B		1 W	
9 KRR-200-C		1 W	
10 KRR-205		1 W	
Relinquished by: <b>Julia Flamman</b>		Date/Time: <b>10/11/07 1330</b>	
Relinquished by:		Date/Time:	
Custody Record MUST be Signed		Received by: <b>W. G. G. Jr.</b>	
Sample Disposal: _____		Date/Time: <b>10-12-07 13</b>	
Return to client: _____		Received by:	
Lab Disposal: _____		Date/Time:	
Sample Type: _____		# of fractions: _____	
LABORATORY USE ONLY		LABORATORY USE ONLY	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.



# Energy Laboratories Inc

## Workorder Receipt Checklist



H07100177

MT DEQ

Login completed by: Wanda Johnson

Date and Time Received: 10/12/2007 1:35 PM

Reviewed by: ~~WJ~~

Received by: wjj

Reviewed Date: 10/16/07

Carrier name: UPS ARS Ground

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	0°C On Ice
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>

Contact and Corrective Action Comments:

Spoke with Moriah Bucy re: Level 4 QC, do not need. Wj